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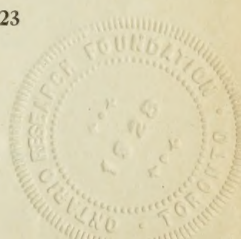
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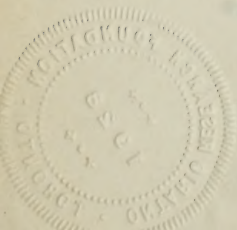
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No. 1

VETERINARY BIOLOGICS

The feeling seems to be rather prevalent among practicing veterinarians that the present licensing system for veterinary biological products, as enforced by the Federal Bureau of Animal Industry, falls far short of what it should be. Some veterinarians even go so far as to say that it has shot by the mark entirely. This is plainly an exaggeration and an unfair criticism of the veterinarians in the Bureau charged with carrying out the provisions of the serum-virus-toxin law.

We have but to look at the improvements in the methods of preparing a single biological product—anti-hog cholera serum—that have come into practice during the past ten years, to see that much good has followed Government supervision, although to give the Bureau credit for all of these improvements would be manifestly unfair to certain serum-producers, who have shown conspicuous initiative in producing a better product.

One of the criticisms most frequently voiced is that no distinction is made between the really meritorious biological products, such as anti-hog cholera serum, tetanus antitoxin and tuberculin, and those of seriously questionable merit, such as abortion bacterin, chicken-pox vaccine and the so-called "mixed infection" biologics. Veterinarians contend that the Government should

have the power to classify all products licensed. For example, the simplest classification that has been suggested is one that would place every biological product in one of three classes, namely:

- A. Those which have been tried and proven.
- B. Those which are purely experimental.
- C. Those which have been tried and found wanting.

In spite of the fact that most veterinarians know that a veterinary license for a biological product carries with it no guarantee of the value of the product licensed, yet it is commonly stated *in defense* of certain of these products that they are duly licensed by the Bureau of Animal Industry, the implication being that the Government would license only worthy and unquestionable products. There is the other side of the story, of course. If the Bureau withholds a license for a product until such time as the manufacturer may present evidence of the efficiency of the product in question, there is immediately heard a cry of unjust discrimination, or of stifling private enterprise, and even of hindering the employment of a product which may be highly valuable in preventing or curing some animal disease.

At the present time a manufacturer may apply for a license for an experimental biological product, and if the license is granted he finds that it is no different from the licenses that are granted for products that have been in use for many years. If the manufacturer wishes to try out the product experimentally, before applying for a license for it, he must confine his experimental use of the product within the limits of the state in which it is manufactured. He can not legally send a drop of it, even without charge and plainly marked for experimental use, to a veterinarian in an adjoining state, without first obtaining a license.

From the very nature of some of these biological products, and more especially the nature of the diseases they are designed to combat, it appears to be very difficult, if not impossible, to evaluate them properly. Time, and the weight of public opinion, must be the deciding factors, and until such time as a biological product can be placed definitely in either class A or class C, it should remain in the experimental class B.

Standardization of biological products, both as to name and composition, particularly the bacterial suspensions, both living and dead, is sorely needed. This is possible of accomplishment without robbing any manufacturer of his individuality. It can be done without "leveling quality", which is the most commonly

heard criticism of any further move in this direction. It appears absolutely ridiculous, in the case of certain bacterins, for there to be such a wide variation in the number of organisms in products of the same name, prepared by different manufacturers.

For a time it seemed to be the goal of every new laboratory that entered the field to have a higher bacterial count (in the advertising literature, even if not in the product) than any other competitor. Apparently the saturation point has been reached, however. Just as long as the present chaotic state of affairs is allowed to exist, veterinarians are going to doubt seriously the honesty or the ability of the manufacturer, as well as the value or the efficiency of the products that he places on the market.

Whether it is the function of the American Veterinary Medical Association to take the lead in this matter, and attempt to bring order out of chaos, so that the practicing veterinarian may feel that he has some real substantial backing, when he uses or refuses to use a certain biological product, is for the Committee on Policy to discuss, with a view to making a definite recommendation to the Association.

WE ARE BUSY

We were late with the March issue, but we have gained a few days with this number. February was a short month, and our first issue happened to be the index number of Volume 62, so we felt we had some excuse for being a little late. It will take some little time for us to learn all the ropes and get things to running smoothly. We are just beginning to realize some of the difficulties that our predecessors, former editors and former secretaries, had to contend with. We are busy, very busy, and happy, too. Happy in the realization that there is lots of real, worth-while work to do, and busy trying to get some small part of it done. It is gratifying and encouraging to receive the sincere expressions of confidence that have come our way, the helpful suggestions and the kind offers of assistance, all of which contribute to make us think that

*Every day,
In every way,
The A. V. M. A.
Is getting better and better.*

RECLASSIFICATION OF FEDERAL VETERINARIANS

After consideration of the reclassification bill by the United States Senate for a period of more than a year, the Bureau of Animal Industry of the Department of Agriculture is glad to have the opportunity of stating that its veterinarians throughout the country are at last to be reclassified according to the quality of the work performed and the responsibilities of the positions occupied by them. The same rules for determining the compensation to be established initially for the employees in the field service are to be observed as in the case of employees in the District of Columbia. A Personnel Classification Board, established by the act, which consists of the Director of the Budget Bureau, a member of the Civil Service Commission, and the Chief of the United States Bureau of Efficiency, or an alternate for each of those services, is required by the law to review and revise, if necessary, the allocations of the various positions as determined upon by the head of the Department, and the action of that board is made final. The reclassification law also requires this board to make a survey of the field services and report to Congress at its regular session in December next schedules of positions, grades, and salaries for such services. This report is to include a list, prepared by the head of the Department, allocating all field positions and fixing the proposed rate of compensation of each employee thereunder. The law further requires that the estimates for the fiscal year 1924, which are presented to Congress in December next, shall conform to the classifications provided in the law and that the rates of salary in the compensation schedules shall not become effective until July 1, 1924.

The following compensation schedule for the professional and scientific service, which includes veterinarians, is specifically provided by the law:

PROFESSIONAL AND SCIENTIFIC SERVICE

The professional and scientific service shall include all classes of positions the duties of which are to perform routine, advisory, administrative, or research work which is based upon the established principles of a profession or science, and which requires professional, scientific, or technical training equivalent to that represented by graduation from a college or university of recognized standing.

Grade one, in this service, which may be referred to as the junior professional grade, shall include all classes of positions the duties of which are to perform, under immediate supervision, simple and elementary work requiring professional, scientific, or technical training, as herein specified, but little or no experience.

The annual rates of compensation for positions in this grade shall be \$1,860, \$1,920, \$2,000, \$2,100, \$2,200, \$2,300, and \$2,400.

Grade two, in this service, which may be referred to as the assistant

professional grade, shall include all classes of positions the duties of which are to perform, under immediate or general supervision, individually or with a small number of subordinates, work requiring professional, scientific, or technical training as herein specified, previous experience, and, to a limited extent, the exercise of independent judgment.

The annual rates of compensation for positions in this grade shall be \$2,400, \$2,500, \$2,600, \$2,700, \$2,800, \$2,900, and \$3,000.

Grade three, in this service, which may be referred to as the associate professional grade, shall include all classes of positions the duties of which are to perform, individually or with a small number of trained assistants, under general supervision but with considerable latitude for the exercise of independent judgment, responsible work requiring extended professional, scientific, or technical training and considerable previous experience.

The annual rates of compensation for positions in this grade shall be \$3,000, \$3,100, \$3,200, \$3,300, \$3,400, \$3,500, and \$3,600.

Grade four, in this service, which may be referred to as the full professional grade, shall include all classes of positions the duties of which are to perform, under general administrative supervision, important specialized work requiring extended professional, scientific, or technical training and experience, the exercise of independent judgment, and the assumption of responsibility for results, or for the administration of a small scientific or technical organization.

The annual rates of compensation for positions in this grade shall be \$3,800, \$4,000, \$4,200, \$4,400, \$4,600, \$4,800, and \$5,000, unless a higher rate is specifically authorized by law.

Grade five, in this service, which may be referred to as the senior professional grade, shall include all classes of positions the duties of which are to act as assistant head of a large professional or scientific organization, or to act as administrative head of a major subdivision of such an organization, or to act as head of a small professional or scientific organization, or to serve as consulting specialist, or independently to plan, organize, and conduct investigations in original research or development work in a professional, scientific, or technical field.

The annual rates of compensation for positions in this grade shall be \$5,200, \$5,400, \$5,600, \$5,800, and \$6,000, unless a higher rate is specifically authorized by law.

Grade six, in this service, which may be referred to as the chief professional grade, shall include all classes of positions the duties of which are to act as the scientific and administrative head of a major professional or scientific bureau, or as professional consultant to a department head or a commission or board dealing with professional, scientific, or technical problems.

The annual rates of compensation for positions in this grade shall be \$6,000, \$6,500, \$7,000, and \$7,500, unless a higher rate is specifically authorized by law.

Grade seven, in this service, which may be referred to as the special professional grade, shall include all classes of positions the duties and requirements of which are more responsible and exacting than those described in grade six.

The annual rate of compensation for positions in this grade shall be \$7,500, unless a higher rate is specifically authorized by law.

The February JOURNAL recorded the fact that eleven members of the Association had already paid up their dues one year in advance. The question was asked: "Who is next?" Seven members responded, and the number thereby increased to eighteen.

PUBLICITY

Most veterinarians agree that the one thing most sorely needed by the veterinary profession today is publicity. Everybody says that we have been hiding our light under a bushel. That those members of the Association who attended the St. Louis meeting were aware of the situation, was evidenced by the prompt approval which they gave to the recommendation of the Budget Committee for a fund to be devoted to publicity purposes. It was recognized that the amount appropriated on this occasion was small and only the beginning. This fact was brought to our attention in a very marked way, when we recently consulted a representative of a national farm paper, relative to rates for space. We asked for a quotation on one insertion of a quarter-page ad in his paper. The cost quoted for this one ad was considerably over one-half of the appropriation made by our Budget Committee. So much for the high cost of advertising.

We are in a position to know that in the very near future one of our leading biological firms will inaugurate a nation-wide advertising campaign in favor of the veterinarian. We have had the privilege of examining the copy of six ads, one of which will appear every three weeks, occupying the space of almost one-half page, in an agricultural paper which has a weekly circulation of approximately one million. These six ads will bear the caption, "WHAT WOULD AMERICA BE WITHOUT ITS VETERINARY PROFESSION?" Each of the six ads will discuss some important phase of the veterinary profession, and each will conclude with the following paragraphs:

"It is imperative that the veterinarian be encouraged, and the greatest encouragement you can give him is to use his services.

"The livestock industry is the cornerstone of America's agricultural wealth—and the veterinary profession is its greatest safeguard."

We know approximately what the advertising bill will be for this publicity. It is a staggering amount, and far beyond anything that the Association would be able to expend in a similar effort at this particular time. We are indeed pleased to know that this splendid work has been undertaken. We cannot commend it too highly.

EXECUTIVE BOARD ELECTIONS

District No. 1: We are pleased to announce the reelection of Dr. George Hilton, of Ottawa, as a member of the Executive Board of the A. V. M. A., for District No. 1 (Canada). Dr. Hilton completed his first term of office in August 1922, and the election which has just been held in District No. 1, should really have been held prior to the St. Louis meeting. The fact that elections in the past have really been held one year late, will explain why it has been necessary to hold elections in Districts Nos. 2 and 3, so soon after the election in District No. 1. As a matter of fact, the terms of office of the present members of the Board from Districts Nos. 2 and 3 will not expire until the close of the meeting in Montreal, but in order that the members-elect may qualify and take office at the close of the annual meeting, the Constitution and By-Laws provides for their nomination and election *prior* to the annual meeting.

Districts Nos. 2 and 3: Nominating ballots for these two districts were mailed from the office of the Secretary on February 27th, which is exactly six months before the annual meeting as provided in the Constitution and By-laws, which rather implies that the polls for nominations should remain open for two months. Section 1 of Article 10 of the By-laws provides that nominations be filed at least four months before the annual meeting, and another period of two months for filing election ballots is implied in the same Article. At the time that this is written (over three weeks after the nominating ballots were mailed), only 174 have been returned from District No. 2, and only 165 from District No. 3. These 339 ballots show the votes to be distributed between 34 members in District No. 2, and 46 members in District No. 3. We would take this opportunity to ask those members in these districts who have not yet filed their nominating ballots, to do so just as soon as possible. The matter of electing the members of our Executive Board has been referred to as being one of the most democratic features of our organization, and for our members to fail to take advantage of this fact is rather surprising.

All that was said at St. Louis, both pro and con, is now a part of A. V. M. A. history, but we did think that it was rubbing it in a little bit recently, when a friend introduced us as "the head of the horse-doctors' union."

DR. GEORGE HILTON

A Biographical Sketch

Dr. George Hilton, who has just been reelected as a member of the Executive Board of the American Veterinary Medical Association, for District No. 1 (Canada), was born in 1872, of English parentage, at Verchotor, Government of Oufa, Russia. He was educated at Grosvenor House School, Lerton Bedfordshire, and the Higher Grade Board School, Bolton Lancashire, England. With his parents, he came to Canada in 1888, and, engaged in mixed farming, at Headingley, Manitoba. He



GEORGE HILTON, V. S.

was Honor Graduate of the Ontario Veterinary College in 1897, and immediately took up practice at Portage La Prairie, Manitoba. The following year he entered into partnership with Dr. J. G. Rutherford.

During the time that he was located at Portage La Prairie, Dr. Hilton was a Director of the Lakeside Agricultural Society, Secretary-Treasurer of the Island Park Turf Club and an alderman in the city council. In 1902 Dr. Hilton was appointed assistant to Dr. J. G. Rutherford, then Veterinary Director-

General of Canada, with title of Chief Veterinary Inspector, in the Department of Agriculture, with headquarters at Ottawa, a position which he still holds. From 1917 to 1921 he was a Director of the Central Canada Exhibition Association, and Chairman of the Dog Show Committee.

Dr. Hilton is an Honorary Member of the Manitoba, Saskatchewan and Alberta Veterinary Associations. He has been President of the Central Canada Veterinary Association since 1914. He is a member of the Advisory Board of the Canadian Veterinary Record and a member of the United States Livestock Sanitary Association. In 1918 he was elected to the Executive Board of the American Veterinary Medical Association, at the first election held for that purpose under the present constitution. He was Chairman of the Board during the year 1921-1922. He is Treasurer of the Andrew Smith Memorial Fund.

AN IMPORTANT DECISION

A law-suit which is of great interest to the veterinary profession and live-stock raisers, as well as to producers of biologics, was tried last month at Des Moines, Iowa. The plaintiff was William Balhorn, an Iowa stock-raiser and the defendant, Pitman-Moore Company, of Indianapolis.

Balhorn's hogs were immunized, in July 1921, with serum and virus produced by Pitman-Moore Company, and sickened in September. Two veterinarians were of the opinion that the trouble was hog cholera, while two others, including a representative of the Bureau of Animal Industry, were unable to diagnose cholera.

The plaintiff alleged that his trouble was caused by impotent serum or virus, and prosecuted his claim for damages on the theory of implied warranty. The attorneys for the plaintiff claimed that since anti-hog cholera serum and hog cholera virus were made for vaccination of swine and the prevention of cholera, there is, in consequence, an implied warranty when such products are sold. At the completion of the plaintiff's evidence, the presiding judge instructed the jury to return a verdict in favor of the defendant, which was done without hearing any of the defendant's evidence. The plaintiff was unable to show negligence of the defendant in the production, ware-housing or handling of the products used, as is required by law.

From the decision in this case, it is evident that the law will

sustain a claim for damages against a producer of biologic, only where it can be shown that the producer has been negligent in the production, ware-housing or handling of his products, and that courts will not look upon the sale of biological products as implying a guaranty of the results from their use. It is also evident that if vaccinated swine develop subsequent sickness, whether cholera or not, this alone does not constitute proof that the products are faulty in potency, virulence or purity.

KEEP MONTREAL IN MIND

The dates for our Montreal convention have been definitely and officially decided—they are August 27, 28, 29, 30 and 31, 1923. The official headquarters selected by the Local Committee on Arrangements will be the New Mount Royal Hotel, which is said to be the largest hotel in the British Empire, and which was opened to the public only a few months ago. If we may judge by the activities of the passenger agents of the various railroads throughout the country, our members will not have a chance to forget that we are going to have a convention in Montreal, in August. We have supplied lists of our members in different sections of the country, to about a dozen of the railroads, for solicitation purposes. No official route has been selected. You have known for sometime where the *place* of meeting would be. Now do not forget the *dates*.

AN APOLOGY

We expected to make some mistakes in our first number of the JOURNAL, but we hardly expected to make such a serious mistake as to credit a paper to the wrong author. However, as we review the facts in the case, we do not feel that we were entirely responsible. The paper entitled, "Observations on the Treatment of Purpura Hemorrhagica" was forwarded by our good friend, Dr. E. R. Steel, of Grundy Center, Iowa. The original manuscript contained nothing whatever to indicate the authorship. We assumed that it had been written by Dr. Steel, but we have been advised by him, since the publication of the paper, that it was written by Dr. L. E. Smith, of Jefferson, Iowa. We hereby make this public apology to Dr. Smith for this error.

INTERNAL PARASITES OF DOGS AND CATS IN THE UNITED STATES AND TREATMENTS FOR REMOVING THESE PARASITES¹

By MAURICE C. HALL,

Senior Zoologist, United States Bureau of Animal Industry,
Washington, D. C.

Dogs and cats are infested with numerous species of internal parasites, and worms of a given species may occur in large numbers in individual hosts, sometimes causing serious injury or even death as a result of massive infestation. Some species of parasites are more injurious than others, hence the importance of a knowledge of these parasites and the injuries due to them. Many of these parasites are more prevalent in young animals than in mature animals and are more injurious to young animals than to older ones, and in such cases the protection of young animals from infection is very important. In this paper especial attention is given to the commoner and more important parasites and to forms occurring in the United States, no attempt being made to discuss the numerous parasites which have been reported only from places outside of this country and its possessions.

FLUKES

Paragonimus westermani. This fluke, known as the lung fluke, is a thick worm 3 to 14 mm. long by 2 to 6 mm. wide by 3.5 to 5 mm. thick. It has been reported from the dog in Ohio and California and from the cat in Michigan, Wisconsin, Minnesota, Missouri and California. It occurs in swine in this country, especially in Louisiana, Arkansas and other Southern States. It occurs in man in China, Japan, Korea, Java and Peru.

The life history of this fluke involves the passage through 2 intermediate hosts, the first host being a snail of the genera *Melania* and *Ampullaria* and the second a fresh-water crab or a crayfish. In the second intermediate host the flukes encyst as larvae on the gills and in the muscles, hypodermis and liver. It is probable that the encysted forms on the gills break off and float about, thus making it possible for a suitable primary host to become infested by drinking water containing these larvae as well as by eating infested crustaceans. When swallowed by such a host,

¹Read at the fifty-ninth annual meeting of the American Veterinary Medical Association, St. Louis, Mo., August 30, 1922.

the young flukes pierce the walls of the digestive tract, enter the abdominal cavity and perforate the diaphragm either directly or after entering the liver. After entering the thoracic cavity, the flukes make their way into the lungs and develop to adults, forming cysts which communicate with the bronchioles or bronchi, thereby permitting the escape of the fluke eggs in the saliva.

The cysts in the lungs are surrounded by inflamed and indurated areas and the adjacent bronchi are congested and more or less inflamed. In man a common symptom is the coughing of blood, or parasitic hemoptysis.

As regards treatment for animals infested with these worms, it is reported in a brief review of a paper by Ando that he has had good results from the administration of tartar emetic, presumably intravenously, but we have been unable to obtain details in regard to this. Low is of the opinion that tartar emetic will prove of value against these flukes. Ando has reported some experiments with dogs which indicate that animals may develop some immunity to reinfestation with these flukes following a first infestation with them.



Fig. 1. *Amphimerus pseudofelineus*. Enlarged. From Barker, 1911.

Preventive measures would lie in the direction of preventing animals from eating crustaceans which might serve as intermediate hosts of the fluke. The intermediate hosts are not yet known for the United States, but the distribution of the parasites in this country and the occurrence of hosts similar to those in the Orient suggest that our crayfish and certain snails may prove to be the usual hosts. Measures for the destruction of crayfish are in order on other grounds, owing to the known economic damage due to them. A prophylactic measure to guard against encysted larval worms consists in the provision of a safe supply of drinking water.

Amphimerus pseudofelineus (*Opisthorchis pseudofelineus*). This is an American liver fluke of cats and is an oblongate fluke,

tapering anteriorly, (Fig. 1), and 5 to 22 mm. long by 1 to 3 mm. wide. It has been reported from the biliary canals of the cat in Nebraska and Iowa.

The life history of this worm is unknown, but judging from its relationships the miracidium on hatching enters a suitable snail and after a period of development becomes infective for fish. In the fish the flukes encyst in the muscles and when such infested fish are eaten by cats, the young flukes make their way to the ducts of the liver, apparently by traveling up the common gall duct, or sometimes enter the pancreatic duct.

Nothing is reported in regard to the lesions and other pathological conditions due to this flukes, but a related species, *Opisthorchis felineus*, may give rise to a thickening of the walls of the ducts of the liver and pancreas, with a related catarrhal condition, the infestation ultimately leading to a true parasitic cirrhosis of the invaded organs.



Fig. 2. *Parametorchis complexus*. Enlarged. From Stiles and Hassall, 1894.

No treatment appears to have been developed as yet for the destruction and removal of these flukes, but if they prove to be blood-suckers they might be destroyed by the use of male fern or kamala or derivatives of these drugs. These drugs do not appear to be effective against liver flukes which are not blood-suckers.

The obvious preventive measure is to prevent cats eating raw or insufficiently cooked fish.

A closely related worm, *Opisthorchis wardi*, has recently been described from the cat in the Philippines.

Parametorchis complexus. The complex liver fluke of cats is a worm 5 to 7 mm. long, sometimes extending to a length of 1 cm., by 1.5 to 2 mm. wide (Fig. 2). It has been reported from the cat in New York, Maryland and the District of Columbia.

The life history is unknown, but is probably similar to that outlined as the probable life history of *A. pseudofelineus*, involving intermediate stages in snails and in fish.

Little is known in regard to the pathological conditions caused

by this fluke, though Stiles and Hassall state that in 1 case the liver was of a peculiar dark color and the ducts contained "a greenish pus-like fluid." Treatment and prophylaxis would be along the lines indicated for *A. pseudofelineus*.

Cotylophallus venustus. This is an intestinal fluke collected from the dog, cat and fox at Washington, D. C. It is very small, attaining a length of only 1.3 mm. The life history is unknown, but judging from related forms it probably has an intermediate stage in fish. There is nothing known about treatments for removing this fluke, but male fern has been found effective against other intestinal flukes, and so has thymol. Prophylaxis is problematical, but preventing animals from eating insufficiently cooked fish is indicated.

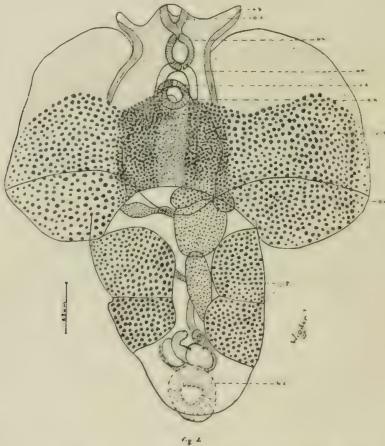


Fig. 3. *Alaria americana*. Enlarged. From Hall and Wigdor, 1918.

Cryptocotyle lingua. This fluke, normally a parasite of gulls, has been reported once from the dog at Detroit, Michigan, by Wigdor under the name of *Hallum caninum*. It is a small fluke, attaining a length of slightly over 2 mm. Its life history involves intermediate stages in such fish as the cunner, tautog, etc. As an accidental parasite of the dog it has some scientific interest but little economic interest.

Alaria americana. The American hemistome of dogs and cats is a worm 3 to 5 mm. long, with a flattened, more or less disk-

like anterior body and a cylindrical posterior body (Fig. 3). On each side of the oral sucker are 2 crescentic projections. This fluke has been collected from the dog in Detroit, Michigan, and more recently by Dikmans at Baton Rouge, Louisiana. Specimens from the cat at St. Paul, Minnesota, were sent in to the Bureau of Animal Industry at Washington, D. C., by Dr. Wm. A. Riley, and Dr. Karl Hanson has collected it from the fox at Keeseville, New York.

The life history of this worm is unknown and the life histories of the entire group to which it belongs have been largely a matter of speculation until recently. Recent developments indicate that much of the speculation was erroneous. It has been generally assumed that the holostomes developed without generations produced by asexual methods of reproduction, that is, without sporocyst development or the development of a number of cercariae in a redia, but recent investigations indicate that these worms develop much the same as do the members of the superfamily Fascioloidea. Larval forms develop and pass through intermediate hosts, including snails and fish or a number of other animal groups. The cercaria has a long, deeply cleft tail.

These flukes appear to have little pathological significance. Jeffreys has reported that these flukes can be removed by carbon tetrachloride, and studies on treatment for the removal of these flukes have been carried on by Dr. Karl Hanson of the Biological Survey. According to a paper by him which I have seen through the courtesy of the Biological Survey and of Dr. Hanson, he has

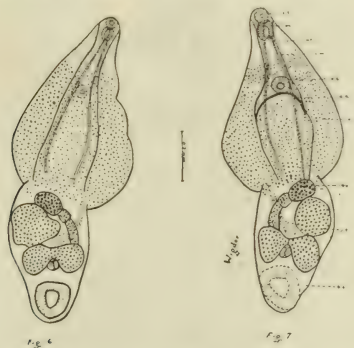


Fig. 4. *Alaria michiganensis*. Enlarged. From Hall and Wigdor, 1918.

found carbon tetrachlorid effective in removing these flukes. This is of interest as showing among other things that in their reactions to anthelmintics flukes are somewhat intermediate between tapeworms and roundworms. Such drugs as carbon tetrachlorid are ineffective against tapeworms, though carbon tetrachlorid is effective against flukes, as noted above. Thymol is most effective against roundworms and will remove some tapeworms, but appears to be more effective in removing certain flukes than in removing tapeworms. Male fern is effective against tapeworms, apparently effective against certain flukes, including the common liver fluke, but is of little value against roundworms, although it has been used to some extent for the removal of some of the roundworms, including hookworms.

Alaria michiganensis. The Michigan hemistome is a small fluke, 1.8 to 1.91 mm. long, somewhat similar to *A. americana*, but smaller and without the crescentic projections at the anterior end (Fig. 4). So far it has only been collected at Detroit, Michigan. The life history is unknown, but presumably is similar to that outlined as the probable life history of *A. americana*. The pathology and treatment are probably similar to those for *A. americana*.

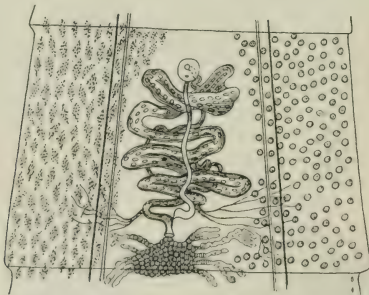


Fig. 5. *Diphyllbothrium latum*. Diagrammatic figure of segment. Enlarged.
From Railliet, 1893.

TAPEWORMS

Diphyllbothrium latum. The broad fish tapeworm (Fig. 5) attains a length of 2 to 9 meters, or longer, and a width of 2 cm., and is usually grayish-yellow to brown in color. The almond-shaped head has 2 slit-like suckers and the neck is thin. This worm has been collected once from the dog in the United States,

being reported from North Dakota by Van Es and Schalk. It has been reported in persons never out of the United States by Nickerson as early as 1906 and there now appear to be a total of 7 such cases, including the recent case reported from Ft. Wayne, Indiana, by Wallace and Grant and 2 cases reported from Chicago, Illinois, by Calvin. The worm occurs in the cat, but there are no American records of its occurrence in this host.

The complete life history of this tapeworm has only recently been ascertained. Janicki and Rosen found that when the tapeworm egg hatched in water, releasing its free-swimming larva, this larva, if swallowed by a copepod, *Cyclops strenuus* or *Diaptomus gracilis*, penetrated the intestine of the copepod and transformed in the body cavity to a procercoid, which is armed with hooks on a globular caudal appendix. The parasitized copepods become less active and move slowly on the river bottom. When these infested copepods are eaten by fish, the procercoids are set free and lose their hooks and the caudal appendix if these have not already been lost in the copepod. The resultant larva traverses the wall of the fish's stomach, enters the body cavity, and makes its way from there to the musculature or the liver, forming the plerocercoid. This is the first case in which a tapeworm has been found to have 2 intermediate hosts and 2 corresponding larval stages. When the plerocercoid in the fish is eaten by a suitable host, as a dog or a man, it develops to the adult worm in the intestine.

From the standpoint of pathology this worm is of especial interest from the fact that in man it causes the so-called *Bothriocephalus* anemia, a very grave form of anemia. It has been claimed that this anemia only occurs in those cases where the strobila, or part of the strobila, dies and degenerates, and that the anemia is associated with the absorption of this dead cestode material. A number of fatal cases of *Bothriocephalus* anemia have been reported, but no case of the sort is reported from the United States. In some cases severe gastric and nervous symptoms have been reported. The symptoms in the case of the dog appear to have received little attention, but the worm is probably a serious parasite in this case also.

This worm does not appear to be difficult to remove by means of such classic treatments as those with male fern or pelletierine tannate. While there are as yet no reports in regard to the efficacy of arecoline hydrobromide in removing this particular tapeworm, the reports in regard to the efficacy of this drug in

removing the commoner tapeworms of the dog suggest that it would be equally as effective against this worm.

The oral administration of arecoline hydrobromide, long used by the veterinary profession as a purgative administered hypodermically, for the removal of tapeworms from dogs is a treatment for which we are indebted to Lentz. This treatment has not been critically tested by the writer, but the reports in regard to its efficacy indicate that it is a more satisfactory treatment than those with other drugs as used heretofore. The drug is given in doses of $\frac{1}{4}$ grain to dogs of average size and $\frac{1}{8}$ grain to small dogs. These are small doses and easy to give. "Results are promptly obtained, the tapeworms passing out in the course of a half hour as a rule, a feature which appeals to the veterinarian's client. No purgative is necessary, as the drug itself is a purgative.

Prophylaxis here, as in the case of some of the flukes already noted, depends on preventing dogs and cats eating raw or insufficiently cooked fish. Here, as in many other cases, prophylaxis also requires, as a measure desirable on many counts, that sewage should not be emptied untreated into fish-inhabited streams.

A somewhat similar tapeworm, *D. cordatum*, has been reported from Greenland and Disco Island as a parasite of the dog, walrus, seal and man.

Diphyllbothrium americanum, the American fish tapeworm, is a small worm, 7.5 to 36 mm. long by less than 2 mm. wide (Fig. 6). It has been found once in the dog at Detroit, but as the specimens were sterile it is likely that they were in an unusual host. The life history of this worm is unknown but is probably similar to that of *D. latum* in a general way. As it is probably an accidental parasite and as no symptoms were observed in connection with it, treatment appears to be of no especial interest.

Diphyllbothrium mansonii. This worm is said to be very similar to *D. latum*, but with a rather wide head, not cordate but suggestive of the head of *D. cordatum*. It appears to have a rather wide distribution and has been reported once in its larval form from this country in Texas.

The egg of this worm hatches in water and releases the free-swimming larva which is swallowed by a small crustacean, *Cyclops leuckartii*, and develops in it to the procercoid. When such infested crustaceans are swallowed by the next host, which may be a frog, snake, chicken, duck, cat, pig, monkey, or man, the procercoid enters the abdominal cavity and makes its way

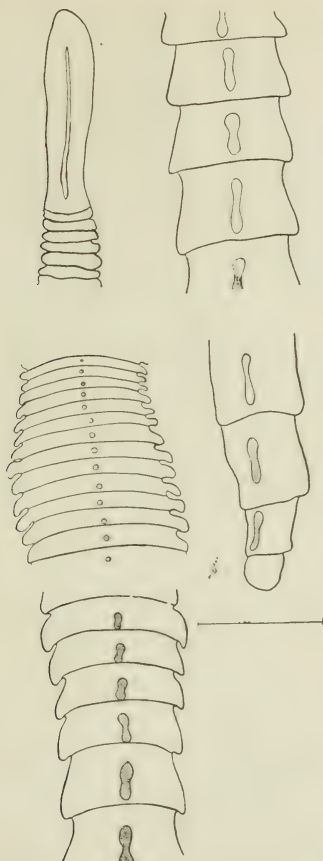


Fig. 6. *Diphylobothrium americanum*. Enlarged. From Hall and Wigdor, 1918.

to various tissues, transforming to a plerocercoid. When such infested tissues are eaten by suitable carnivores, as the dog and cat, they develop to the adult worms in the intestine.

This worm appears capable of causing pathological conditions in the primary host. In a feeding experiment, Okumura reports that a dog in which 5 tapeworms developed became progressively

weaker and died on the forty-fifth day. The larval worms, or plerocercoids, may cause serious injuries to the host animal. Yoshida reports that an infested cat died in an extremely emaciated and anemic condition. Suppuration may occur at the site of infestation. Their wandering habits as tissue invaders make these worms dangerous parasites and the occurrence of this worm in this country, even in an isolated case, warrants an effort to prevent its establishment and spread. Worms resembling *D. latum* in dogs should be given especial attention with reference to the possibility that they may be *D. mansoni*. The larval forms, referred to in the literature as *Sparganum mansoni*, are said to be especially prevalent in frogs in some parts of Japan.

The treatment for the removal of this worm is substantially the same as that for *D. latum*. Prophylaxis calls for thorough cooking of animal food to prevent infestation with the adult worms from ingestion of the plerocercoids, and the provision of a safe water supply to prevent infestation with the plerocercoids from the ingestion of infested crustaceans.

Mesocestoides lineatus. This worm has a head armed with 4 oval suckers, but without hooks, the worm attaining a length of 25 cm. to 2.5 meters. The genital pores open near the median



Fig. 7. *Mesocestoides lineatus*. Portion of strobila, showing mature segments. Enlarged. From Hall, 1919, after Neumann, 1896.

line of the segment on the ventral surface. (Fig. 7). The worm occurs in the dog and cat and some wild carnivores. The present writer has found a *Mesocestoides*, apparently this species, once in a dog imported from Europe by a soldier of the American Expeditionary Forces at the close of the late war. It was only found once in over 1000 imported dogs. However, the writer has also some specimens of a *Mesocestoides* collected from an American dog, though there has not yet been opportunity to make a specific determination of these worms.

The life history of these worms is as yet unknown. The worms probably cause about the same injury and symptoms that tape-worms in dogs and cats usually do, and the treatment is probably the same as that already given.

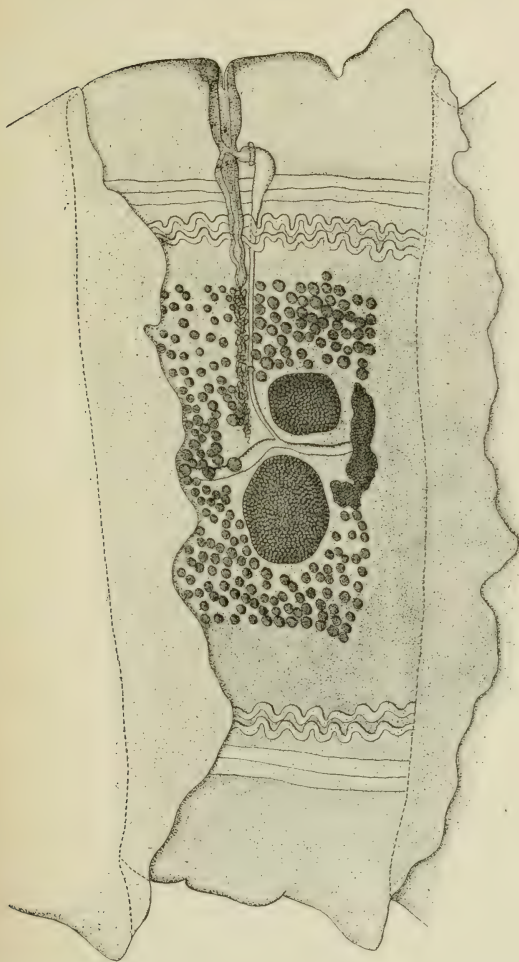


Fig. 8. *Tania taeniaeformis*, Mature segment. Enlarged. Sphincter vaginae shown at right. The vagina presents the appearance of terminating in the uterus. From Hall, 1919.

Taenia taeniaeformis (*T. crassicollis*). The thick-necked tapeworm of cats is easily identified by the head, which is cylindrical anteriorly and armed with very large hooks, 380 to 420 μ long, and by the absence of a neck, the segmentation beginning immediately behind the head. A peculiarity of the mature segment is the presence of a well-developed sphincter vaginae (Fig. 8). This worm is 15 to 60 cm. long.

The cysticercus of this tapeworm, *Cyst. fasciolaris*, commonly occurs in mice and rats, but is also reported from the vole, mole, lemming, beaver and bat. These animals become infested with cysticerci as a result of swallowing the tapeworm eggs in the feces of the cat, the cysticercus developing in the liver; cats become infested with the adult tapeworms as a result of swallowing the cysticerci in the livers of these intermediate hosts.

These worms appear to be distinctly pathogenic for cats. When present in numbers in a cat the animal loses its appetite, refuses food, and may show a transient diarrhea, followed by obstinate constipation. Salivation may be present. The abdomen is strongly retracted. If not relieved of its parasites by treatment, the animal becomes prostrate and may die in epileptiform convulsions. Chronic intestinal catarrh and gastritis have been reported. The intestinal mucosa is found inflamed on postmortem examination.



Fig. 9. *Taenia balaniceps*. Head. Enlarged. From Hall, 1919, after Hall, 1910.

Presumably arecoline hydrobromide would be as satisfactory a drug for the removal of this tapeworm from cats as it is for the removal of tapeworms from dogs, the dose being diminished to one suitable for cats.

Prophylactic measures in the case of this worm are somewhat complicated from the fact that whereas preventing cats from eating rats and mice is prophylactic, the catching of these rodents, which often involves the eating of them, is a leading function of many cats.

Taenia balaniceps. This tapeworm has been reported from Nevada and southern New Mexico, in one case from the dog, and in the other case from the lynx. It has a rather characteristic acorn-shaped head (Fig. 9). Nothing is known as to its life history, pathological effects or treatment.

Taenia pisiformis (*T. serrata*). This is one of the most common of the dog tapeworms, but is very rare in cats. It can be identified by its large hooks, which are 225 to 294 μ long. (Fig. 10).

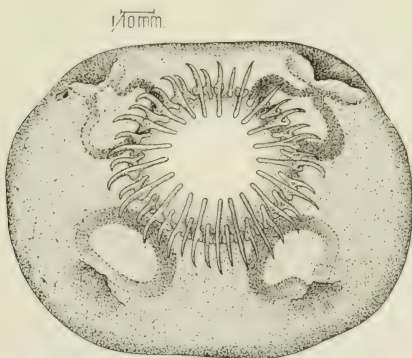


Fig. 10. *Taenia pisiformis*. Head, viewed from the front. Enlarged. From Hall, 1919.

The bladderworm of this tapeworm, *Cyst. pisiformis*, is a common parasite of hares and rabbits and has been reported from the mouse and the mountain beaver. It occurs in the liver or mesenteries or free in the abdominal cavity of these hosts. Dogs become infested with the adult tapeworm by eating infested viscera of rabbits, and rabbits become infested with the cystic stage by swallowing tapeworm eggs from the feces of dogs and other hosts.

Tapeworms in the dog may cause changes in appetite, disposition to vomit, general restlessness and cramps. Railliet has reported a case of perforation peritonitis in a dog, the animal dying and 3 specimens of this tapeworm being found in the abdominal cavity postmortem. The writer has seen marked areas of inflammation at the points of attachment of specimens of this tapeworm, though in many cases these are not present. Other gastro-intestinal lesions and certain nervous disturbances may be due to tapeworms.

The arecoline hydrobromide treatment is indicated in cases of infestation with this worm. Prophylaxis is a matter of preventing dogs eating the viscera of rabbits unless the viscera are first properly cooked.

Taenia hydatigena (*T. marginata*). The marginate tapeworm is the largest of the taenioid tapeworms of the dog, though smaller than *Diphyllbothrium latum* or *D. mansoni*. The mature

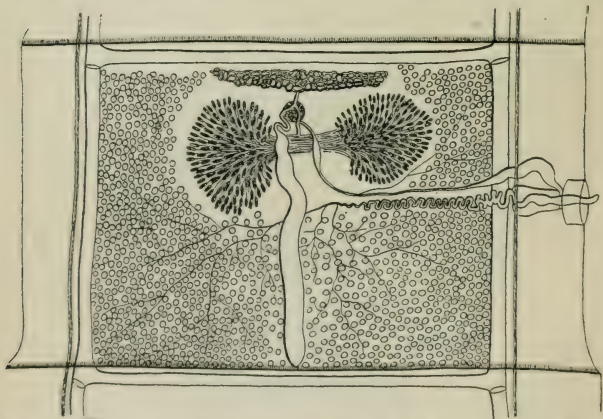


Fig. 11. *Taenia hydatigena*. Mature segment. Enlarged. From Hall, 1919 after Deffke, 1891.

segments are wider than long (Fig. 11). It was at one time very common in the United States, and doubtless is still very common in some localities, but in many places where it was once common it is now becoming scarce, owing to the fact that where food animals are slaughtered under proper supervision the inedible viscera containing the cysticerci, *Cyst. tenuicollis*, of this tapeworm are tanked and the parasites destroyed. Under the

insanitary conditions which were once more or less prevalent about slaughterhouses, dogs had access to these viscera and became infested with the tapeworms from eating the bladder-worms in viscera, as these larvae occur in the liver, mesenteries and omenta of cattle, sheep and swine.

The pathological conditions are those due to tapeworms in general in dogs and the indicated treatment is with arecoline hydrobromide. Prophylaxis, as already noted, is largely the use of the "condemned" tank under the conditions of adequate meat inspection.

Taenia ovis. This tapeworm is best identified by the use of stained mounts, a distinctive feature being the position of the vagina, this structure either barely clearing the anterior margin

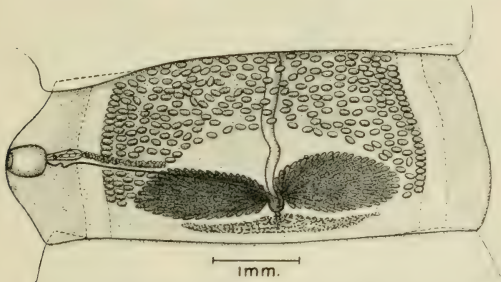


Fig. 12. *Taenia ovis.* Mature segment. Enlarged. From Hall, 1919, after Ransom, 1913.

of the nearest ovary or else crossing this ovary. (Fig. 12). This species has been reported in the cystic stage from Montana, Idaho, Washington, Oregon, California, Colorado and Nevada. It occurs as an adult worm in the dog, with its cysticercus in the voluntary muscles, heart, esophagus and lungs, and possibly in the kidneys and walls of the stomach, in sheep and goats. The life history is along the same lines as those of the foregoing species, involving the eating of infested portions of the carcass of the secondary host by the primary host, and the swallowing of eggs from the feces of the primary host by the secondary host. The pathology of infestations with this worm in the dog is substantially the same as for dog tapeworms in general. Treatment is the same as for other dog tapeworms. Prophylaxis involves preventing dogs eating raw mutton or goat meat, all such meat fed to them being first properly cooked, and the carcasses of

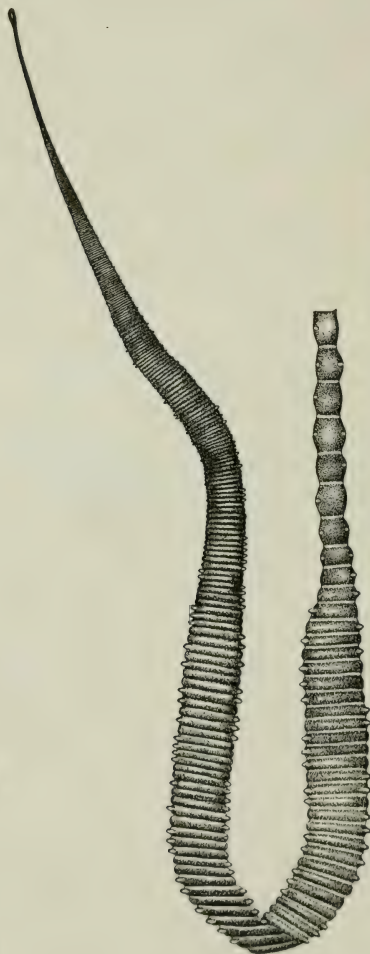


Fig. 13. *Tænia krabbei*. Entire strobila. Actual size. From Hall, 1919, after Meniez, 1880.

dead sheep and goats on the range or pasture being burned or otherwise disposed of in such a manner that dogs cannot eat them.

Taenia krabbei. This worm is readily identified by the presence of a small head armed with hooks and 4 suckers, and of segments which are always much wider than long except in the case of the last 7 or 8 terminal gravid segments. (Fig. 13). This worm has been collected in Alaska and in Iceland. The cysticerci develop in reindeer. So far as dogs are concerned, the treatment and pathology of infestations with this worm are probably much the same as in the case of other dog tapeworms.

Multiceps multiceps. The gid tapeworm occurs in the dog and has been developed in the coyote. Gid is enzootic in Montana and sporadic cases of this disease in sheep, due to the bladderworm of this tapeworm, have been reported from Ohio, New York, Colorado and Arizona. The tapeworm is a rather delicate, translucent affair (Fig. 14), and its large hooks are comparatively

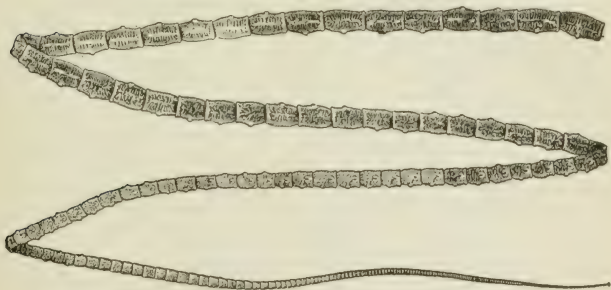


Fig. 14. *Multiceps multiceps*. Entire strobila. Actual size. From Hall, 1919, after Hall, 1910.

small, being only 150 to 170 μ long. The eggs of this tapeworm in the feces of dogs develop to a bladderworm with many heads, called a coenurus, usually in the brain, but sometimes in the spinal cord, of sheep, goats and cattle. Infested animals are said to have the gid, and they show distinctive nervous symptoms, usually circling and carrying the head to one side. Such animals die in almost all cases and dogs or coyotes may eat the brain containing the larval tapeworm. The writer has shown that dogs get the brain from a sheep skull by licking it out through the foramen magnum, usually after enlarging the foramen.

The heads on such a bladderworm develop to adult tapeworms in the dog.

The pathology of infestations with this tapeworm is similar to that of dog tapeworms in general, but owing to the presence of numerous heads on the bladderworm, dogs are more likely to be infested with a large number of worms, and Henry has reported one case in which a dog died of intestinal obstruction due to massive infestation with tapeworms of this species. The treatment is the same as that for other dog tapeworms.

Prophylaxis is largely a matter of destroying the skulls of sheep dying of gid in order to destroy the bladderworm and prevent the infestation of dogs and coyotes. In actual practice it is difficult to get sheepmen and farmers to do this and gid continues to kill sheep in Montana as it has done for over 30 years. A supplementary measure in this case, as in the case of other dog and cat tapeworms is the routine treatment of these animals to remove tapeworms. Where animals are exposed to tapeworm infestation of any sort, it may be advisable to treat for tapeworms 4 times a year. Sheep dogs especially should be kept free from tapeworms.

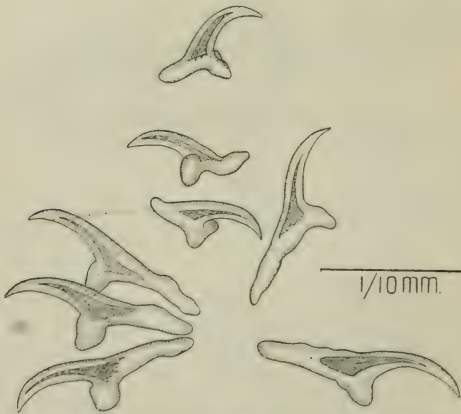


Fig. 15. *Multiceps serialis*. Large and small hooks. From Hall, 1919.

Multiceps serialis. This tapeworm is somewhat similar to the foregoing, but is a less delicate worm. The hooks (Fig. 15) are very variable in form; the small hooks are 78 to 120 μ long.

It is quite common in dogs in the United States. The larval stage, a coenurus, occurs in rabbits and squirrels in the connective tissue, intermuscular, subcutaneous, in the heart muscle, etc. The pathology is somewhat similar to that for *M. multiceps*, the worms tending to occur in massive infestation owing to the development of numerous heads from the coenurus. Henry and Ciuca state that sometimes infested dogs pass masses of these worms and the infestation terminates spontaneously. Treatment is the same as for previous species of tapeworms. Prophylaxis calls for preventing dogs eating infested rabbits.



Fig. 16. *Echinococcus granulosus*. Strobilate tapeworm. Enlarged.
From Hall, 1919, after Leuckart, 1880.

Echinococcus granulosus (*Taenia Echinococcus*). The hydatid tapeworm, which is less than 1 cm. long (Fig. 16), occurs in the dog and cat and in certain wild carnivores. It has been reported from the dog at Washington, D. C., by Curtice in a natural infestation and Welsh has developed it by feeding the hydatid to a dog. Ransom has reported it from the dog in Alaska. Kaupp states that it was found *post mortem* in 50 per cent of 80 dogs examined. The hydatid, or larval stage, occurs in man, almost all the domestic animals, including the dog and cat, and in a large number of wild animals, and develops in practically every organ and tissue. Hydatids are not uncommon in some parts of the United States, and while we have few records of the adult worm in dogs this is primarily due to the fact that they are not looked for to any great extent.

While the adult tapeworms of this species may be removed by anthelmintic treatment, it is inadvisable to treat such animals. Hydatids are a serious menace to human beings as well as to live stock, and dogs infested with this parasite should be killed and burned or disposed of in such a way that the carcass cannot serve as a focus of infection for hydatid disease as a result of the tapeworm eggs contained in it.

Prophylaxis in the case of this worm is best accomplished by the extension of proper meat inspection with its use of the "condemned" tank to interrupt the life cycle of such parasites as this one. Control of dogs, especially the wandering dog that finds its

meals in the offal from the country slaughter house, is another measure of value.

Dipylidium caninum. The double-pored tapeworm of dogs and cats is very common in this country. It can be readily recognized from most dog and cat tapeworms by the double genital pores in each segment, but must be differentiated from another *Dipylidium*, *D. sexcoronatum*, by the fact that the latter species has 6 rows of hooks on the head and *D. caninum* has only 3 or 4 (Fig. 17). Both species occur in the dog and cat, *D.*

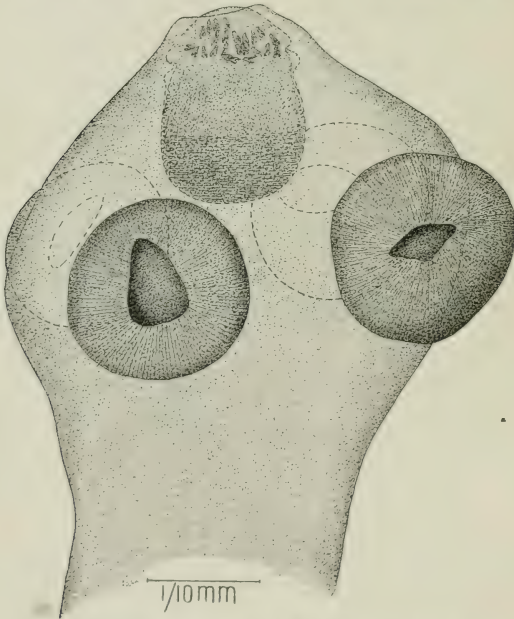


Fig. 17. *Dipylidium caninum*. Head. Enlarged. From Hall, 1919.

sexcoronatum having been reported from the cat by Chapin. This latter species has now been reported from Maryland, Massachusetts and Michigan.

The life history of *D. caninum* involves intermediate stages in fleas or biting lice. Biting lice become infested while feeding on the dog's skin with its contamination of fecal matter containing

tapeworm eggs. Fleas do not become infested as adult insects, but are infested as larvae. In both insects the larval tapeworms develop in the body cavity, the larva being known as a cryptocystis. In the flea the development to a cryptocystis does not take place until the larval flea changes to an adult. When infested fleas or lice are swallowed by dogs, the larval tapeworms develop to adults.

These worms differ from most dog and cat tapeworms in that the head is driven into the mucosa and works through it, drawing the strobila after it "like a train of cars," as Schiefferdecker puts it. This impairs the integrity of the mucosa and makes the removal of the worms difficult. The worms may cause a chronic diffuse catarrh, with an enlargement of the villi, which may become 4 to 5 times normal size. The escape of the segments of the worm from the anus often occasions pruritis, causing dogs to pull themselves along in a sitting posture to alleviate the itching, and this is especially true when a chain of segments is passing out.

Treatment is the same as for other dog and cat tapeworms, but the removal of the worm is sometimes difficult, owing to the fact that the head is buried in the mucosa and may not be removed by the anthelmintic.

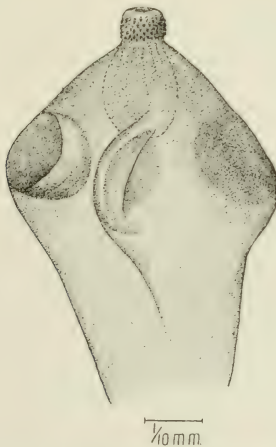


Fig. 18. *Dipylidium sexcoronatum*. Head. Enlarged. From Hall, 1919.

Prophylaxis is largely a matter of control of lice and fleas on dogs and cats.

Dipylidium sexcoronatum. The morphology of this worm (Fig. 18) has been briefly noted in connection with the discussion of *D. caninum*. The pathology and treatment are apparently much the same as for the last mentioned species. The life history is unknown.

ROUNDWORMS

Strongyloides stercoralis. The *Strongyloides* of man occurs in this host (man) in the United States. Fülleborn states that this species is readily transmissible to dogs and has found in the dog in China and Japan a species which appears to be identical with this. As these are small worms and easily overlooked, the parasitic female being only 2.4 to 2.64 mm. long, it is quite possible that they occur in dogs in the United States in spite of the fact that they do not appear to have been reported from this host.

These worms have a somewhat complicated life history. There are no parasitic males, the parasitic females being parthenogenetic. These females deposit eggs in the epithelial cells lining the intestinal walls and covering the villi. After hatching, the rhabditiform larvae escape to the lumen of the intestine and pass out in the feces. Under favorable conditions these larvae may develop to filariform larvae capable of infecting a new host either by way of the mouth or of the skin, or may develop to free-living males and females. In the latter case the eggs produced by the females may develop to rhabditiform larvae and these to infective filariform larvae which may infect a new host by way of the mouth or the skin. The infective larvae enter the blood stream and make their way to the lungs where they enter the air passages, ascend the trachea, and are swallowed, developing to adult females in the lumen of the intestine.

Owing to the fact that the female worm burrows into the mucosa, these worms may give rise to certain tissue reactions, as evidenced by the cell proliferation in the affected regions. An associated anemia may also be due to these worms. The invasion of the mucosa may open portals of entry for pathogenic bacteria. Apparently the worm is not responsible for the diarrhea formerly attributed to it.

The removal of these worms from man has been found very difficult and apparently repeated treatments are necessary, as

the worms which are in the mucosa depositing eggs are apparently not accessible to treatment. Willis has reported good results from oil of chenopodium and Stiles reports that flowers of sulphur is sometimes effective.

Prophylaxis is largely a matter of sanitation with reference to the proper disposal of feces carrying infective material. Cutaneous infection must be guarded against.

Oslerus osleri (*Filaria osleri*). These worms occur in the trachea and bronchi, and apparently in the pulmonary parenchyma also. They were first collected and described from Canada by Osler and have been found in this country by Milks at Ithaca, New York. The male is 5 mm. long and the female 9 to 15 mm. long. The vulva is very close to the anus (Fig. 19).

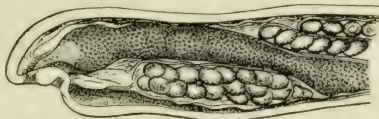


Fig. 19. *Oslerus osleri*. Female tail. From Rabe, 1883.

The eggs produced by the female hatch in the uterus, giving rise to larvae which evidently make their way up the trachea and are either coughed out or swallowed and passed in the feces. They have been kept alive for a week in physiologic saline solution. Nothing more is known as yet in regard to the life history, but we may surmise from the relationships of this worm that it requires some intermediate host, possibly an arthropod, for its development.

These worms enter the lining of the trachea and bronchi, setting up a circumscribed trachitis or bronchitis which terminates in the formation of greyish-red nodules, variable in size and shape and attaining a diameter at times of 5 to 10 mm. They are most prevalent and largest at or near the bifurcation of the trachea. The infestation may give rise to a hard, dry cough, most noticeable after exercise or exposure to cold air. In heavy infestations there may be difficulty in breathing. The disease apparently runs a chronic course, but symptoms may come on suddenly and be followed soon after by death from asphyxia.

Treatment is unknown. Expectoants, cough remedies, inhalations of creosote and guaiacol, and intratracheal injections of 1 percent phenol in equal parts of alcohol and water have

proven ineffective, as might be expected from the fact that the worms are protected by the nodules in which they lie.

Exact measures of control are unknown owing to our lack of knowledge of the life history, but sanitary measures in disposing of feces are indicated as of some value.

Dirofilaria immitis (*Filaria immitis*). This parasite was first described by Leidy from the dog in the United States and appears to be not uncommon in the South. It has recently been reported from the cat by Riley in a note presented at the Helminthological Society of Washington, this being the first record of this parasite from the cat. These worms are very long, the male 12 to 18 cm. long and the female 25 to 30 cm. long. As adults they occur in the circulatory system, especially in the right side of the heart and in the pulmonary artery, and have also been reported from the thoracic cavity, bronchi, esophagus, stomach and liver and free or in cysts in the subcutaneous and intermuscular connective tissue. The larvae occur in the blood and are occasionally found in cutaneous lesions.

The larvae disappear from the peripheral blood in the daytime, but are present there at night, a habit associated with the night-feeding habits of the mosquitoes which act as their intermediate hosts. When mosquitos take in these larvae in sucking blood, the larvae usually invade the Malpighian tubules of the insects and develop there, later escaping to the body cavity and making their way to the mouth parts of the host. It is probable that these larvae escape from the mouth parts as do the larvae of the human filaria, *Filaria bancrofti*, by breaking through the tip or sides of the labium, and then enter the wounded skin.

Infested dogs may show no symptoms of disease, though such animals may die suddenly. Death may follow from asphyxia, embolism or hematemesis. Occasional animals show convulsions or rabiform symptoms. Lung troubles, edema, ascites, epistaxis, photophobia and fixity of vision have been reported as symptoms. The larvae may cause parasitic fibrous nephritis or pseudo-tuberculous foci. As many as 150 adult worms may be present, such massive infestations giving rise to hypertrophy of the right ventricle, endocarditis, endarteritis, thrombosis, pulmonary congestion and related conditions. Diagnosis should be made on a careful examination of the blood.

No treatment has yet been found effective in destroying these worms. A measure which has been reported as effective in the

control of these worms in the Fiji Islands consist in the use of mosquito-proof kennels with self-closing doors.

Spirocerca sanguinolenta. This parasite of the dog and of certain wild carnivores has been found in the United States in New York, Alabama, Georgia and the District of Columbia, specimens from Georgia and the District of Columbia being in the collection of the Bureau of Animal Industry. In the same collection are specimens from *Lynx canadensis*, the lynx being from the National Zoological Park at Washington. The worms are red when freshly collected, the males being 3 to 5 cm. long and the females 6 to 8 cm. long. They occur in tumors in the esophagus and stomach usually, but also in tumors in the aorta, the lymph glands, respiratory tract, liver and intestine.

The eggs, which contain an embryo when deposited, pass out in the feces of the primary host and are swallowed by coprophagus beetles. The eggs hatch and the larvae bore through the intestinal walls and encyst in the body cavity of the insect, developing there to the infective stage. When such infested beetles are swallowed by a suitable primary host the larvae make their way to certain tissues and organs and there develop to adults.

The tumors caused by these worms give rise to very variable lesions and symptoms, due to their varying locations. In the digestive tract they may cause stenosis or perforation of the esophagus, vomiting, loss of appetite, emaciation, dysphagia, eructations, nausea, and sometimes peritonitis. In the circulatory system they may cause angina, dyspnoea, suffocation syncope and internal hemorrhage. In the respiratory tract they cause cough, accompanied by nausea and vomiting, and a short noisy aspiration. At times nervous symptoms are well marked. The prognosis is grave, the infestation usually terminating in the death of the animal.

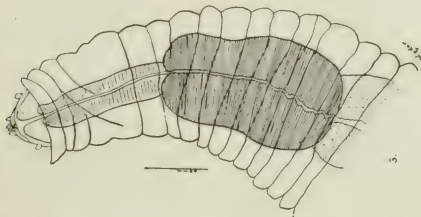


Fig. 20. *Physaloptera rara*. Anterior extremity of female. Enlarged.
From Hall and Wigdor, 1918.

There is no known treatment for the destruction and removal of these worms. Prophylaxis depends on preventing dogs from eating the beetles which are the secondary hosts. While one might suppose that dogs do not eat beetles, the infestations with these worms show that they do so in some places to a considerable extent. The supervision of a dog's food and his habits in general, and the use of a suitable muzzle, if necessary, would apparently be prophylactic.

Physaloptera rara. This worm (Fig. 20) has been found only once, being reported from the duodenum of a dog at Detroit, Michigan. This is probably a case of accidental parasitism, the worm being presumably a parasite usually occurring in some other host, possibly a wild carnivore.

Diocotylome renale. The giant kidney worm of the dog is a large, cylindrical, blood red worm, attaining a length of 102 cm. and a width of 1.2 cm. It is usually in the kidney or free in the abdominal cavity, but has also been reported from the liver and thoracic cavity and has been found encysted in the abdominal cavity. The records available to me at the present time show that this worm has been found in dogs in the United States up to the present time in about 70 cases. This parasite is also reported from the horse, cattle, swine, some wild carnivores and man.

The life history is not yet known. When the female worm is in the kidney the eggs pass out in the urine, but when she is in the body cavity the eggs are largely picked up by the omentum and apparently are not in a position to carry on the life cycle. The eggs develop slowly and require moisture for their development. The embryo forms in 5 or 6 months in winter and may survive for 5 years under favorable conditions. Ciurea has recently found in the muscles of a fish, *Idus idus*, a nematode larva which he believes is the larva of *D. renale*. A dog fed 14 specimens of this fish developed a female *D. renale* 63 cm. long in the course of 4 to 5 months. The larva was 1.715 mm. long. Jägerskiöld believes that a nematode larva found in a fish by Schneider is a larva of *Eustrongylides*, a genus related to *Diocotylome*, and Travassos has recently reported a similar observation. It therefore appears that fish act as intermediate hosts of the giant kidney worm. Balbiani was unable to get the eggs to open in the intestines of various fish. This may have been due to unfavorable circumstances of some sort or it may be that

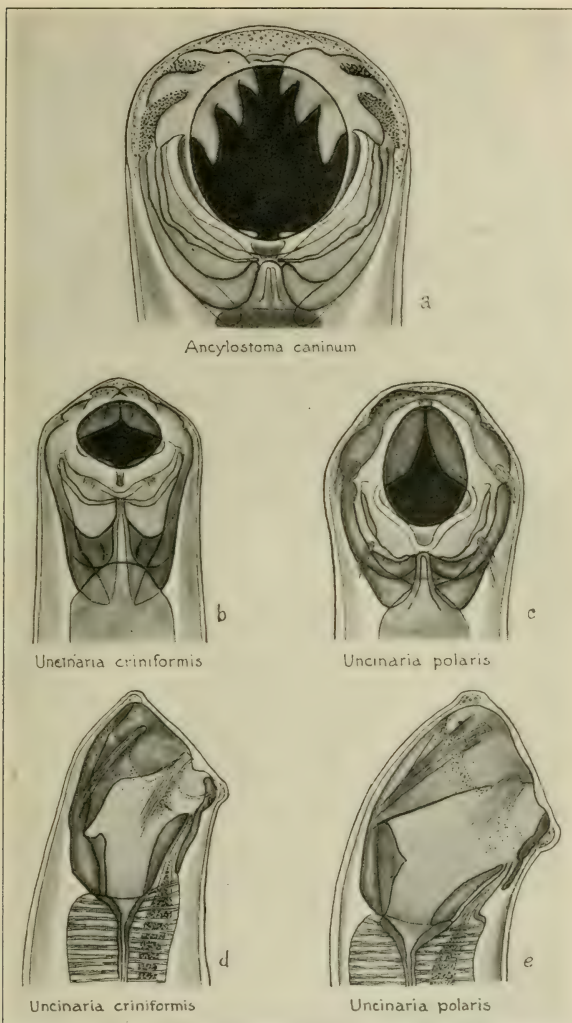


Fig 21. Hookworms. Heads in dorsal and lateral views. Enlarged. From Riley and Fitch, 1921, after Looss, 1911. *Uncinaria polaris* is *U. stenocephala*. *U. criniformis* is not yet known from dogs or cats.

another intermediate host is necessary before the fish, as in the case of *Diphyllbothrium latum*.

Infested dogs are said to be dull as a rule and to have a wabbling gait and a hoarse bark. Nervous symptoms sometimes simulate rabies. Sometimes the pain leads to constant whining or barking, the dog throwing itself about. Where the worm is in the abdominal cavity no symptoms may be noticed. Positive diagnosis depends on finding the eggs in the urine.

Treatment for the removal of this worm is surgical, but the presence of the worm is usually not ascertained antemortem. Luckhardt has reported the removal of this worm from the abdominal cavity in 2 cases, with recovery noted in 1 case, but the worms were only found incidentally in connection with a laparotomy for other purposes. Brumley has reported a similar case, the dog in this case being killed after the operation.

So far as can be judged at present, prophylaxis is a matter of preventing dogs from eating insufficiently cooked fish.

Ancylostoma caninum. This is the common hookworm of dogs in the United States, being especially prevalent in the South, and is also a parasite of the cat, though it seems to have received little attention in connection with the latter host. It is easily identified by the 6 prominent curved teeth near the ventral border of the mouth capsule (Fig. 21).

The eggs produced by the female hookworm pass out in the feces and develop embryos which hatch and develop in turn to infective larvae. These larvae are capable of infecting dogs by way of the skin or of the mouth. In the host, the larvae enter the blood stream, make their way to the lungs, enter the air passages, ascend the trachea, and are swallowed. After some further development they become adult worms in the intestine.

These worms are responsible for the condition known as kennel anemia. The symptoms are those usually associated with blood-sucking worms—anemia, edema, weakness, and emaciation. There may be digestive disturbances with diarrhea or constipation, sometimes with blood macroscopically visible in the feces. Some of the symptoms appear to be associated with a toxin production by the worms. Among other things, dogs suffering from hookworms may have a sunken eye, foul breath, unthrifty coat, erythema inside the thighs and elbows, albuminuria, epistaxis and pronounced dullness and depression. Operative wounds or accidental injuries heal slowly on such animals and there is a tendency to ulcer formation. On postmortem exam-

ination the characteristic finding is the presence of petechiae in the small intestine marking the points of attachment of the worms. Diagnosis may be made on the clinical findings but should be confirmed by microscopic examination of the feces and the finding of the elliptical, thin-shelled eggs.

The treatment of dogs for hookworm disease has been a difficult matter. Thymol was not very effective and although oil of chenopodium, especially if followed by chloroform, would remove a high percentage of the worms present it was also toxic in too many cases in the dose necessary to remove hookworms. In 1921 the carbon tetrachlorid treatment for the removal of hookworms from dogs was developed in the Bureau of Animal Industry and this treatment has come into general use since that time. The chemically pure drug is administered in capsules at a dose rate of 0.3 cc per kilo of weight, making a dose of 3 cc for a dog of average size (22 pounds). The dog should be fasted overnight and not fed for 2 or 3 hours after treatment. No purgative appears to be necessary with carbon tetrachlorid as the drug acts in therapeutic doses as a mild purgative, but the administration of salts after carbon tetrachloride has been found in human medicine to diminish unpleasant symptoms and increase the safety of the drug. Hemorrhagic enteritis, hepatic cirrhosis and renal lesions appear to be contra-indications for the use of this drug.

Care must be taken that the capsules do not break in the mouth and allow the drug to enter the lungs. If this happens the animal will collapse and may die. Some of these cases are revived by artificial respiration, holding the animal head down to allow the escape of the heavy vapors of the drug from the lungs. Properly given the drug has a large margin of safety, and Hall and Shillinger report the administration to a 20-kilo dog of 320 cc of the drug, a dose at the rate of 16 cc per kilo, or 53 times the therapeutic dose rate. This is an unusually large safety factor for a drug. In the presence of the contra-indicative conditions noted above, the safety factor is greatly reduced.

Prophylaxis for hookworm disease is essentially a matter of cleanliness. Frequent and thorough removal of feces from yards and kennels is important. Dirt surfaces should be scraped off and renewed from time to time and wooden and concrete structures cleaned with boiling water, lye and soap, or hot, strong, coal-tar solutions, depending largely on the vigorous and thorough use of a good brush for results. Pups especially require clean

quarters for the first few months of their lives as this is the danger period in which they are most susceptible to the worms and to the damage caused by them.

Ancylostoma duodenale. This is the Old World hookworm of man and occurs in man in the United States, though less commonly than does *Necator americanus*, the American hookworm of man. Looss has been able to infect young dogs with these worms and so have Calmette and Breton and also Alessandrini, the last named developing 1 male and 2 females to sexual maturity. Miyagawa has reported this worm from the dog at Tokyo. It is given passing mention here as a matter of interest.

Uncinaria stenocephala. The mouth parts of this hookworm have cutting plates but no curved teeth. (Fig. 21). The only records of this worm from the dog in the United States are one by Muldoon at Ithaca, New York, and one by McNair at Berkeley, California, the latter finding the worm in a Chow dog imported from China. This worm is, however, the common parasite of foxes in this country. Ransom has pointed out that it appears to have a more northern range than *A. caninum*. The life history and prophylaxis are substantially the same as those for *A. caninum*. The treatment is also the same, the work of Allen, Hanson and others having shown that carbon tetrachloride is about as effective in removing these worms from foxes as it is for removing *A. caninum* from dogs, and that it is much safer for foxes than the drugs previously used for removing hookworms from these animals.

Necator americanus. This is the American hookworm of man. Stiles has reported the collection of what is apparently this species from the dog in the Southern United States on two occasions, and Stiles and Goldberger have developed this worm to the fourth-stage larva in the dog by cutaneous infestation. It is mentioned here as of interest rather than as of importance to veterinarians.

Ollulanus tricuspis. This worm occurs as an adult in the stomach and the gastric mucosa of the cat and has been reported once from this host in the United States at Washington, D. C. The larvae have been reported from the gastric mucosa, pleura, diaphragm, liver and lungs of the cat and from the muscles, heart, esophagus and the connective tissues of the cervical region of mice. This is a very small worm, the male being only 0.56 mm. long and the female about 1 mm. long.

The life history is incompletely known. The eggs hatch in

the uterus and some of the larvae pass out in the feces while others migrate into the host tissues in a manner similar to that of trichinae. The latter form cysts and seem to degenerate rather rapidly, which would suggest that this was not a normal part of the life cycle. Larvae fed to mice entered the tissues and encysted, but these encysted forms did not develop to adults when infested mice were eaten by cats.

The worms in the tissues give rise to inflammation and in heavy infestations this may result in the death of the animal. The bronchial mucus is bloody and contains motile larvae. The adult worm may cause severe inflammation and ecchymoses or a chronic catarrhal gastritis. Galli-Valerio reports a case in which the stomach showed only a slight hyperemia.

No treatment is known. Prophylaxis is uncertain, though the possibility remains that mice may be intermediate hosts and that if cats are not allowed to eat these and other rodents they may be safe from infestation with these worms.

Trichuris vulpis (*Trichuris depressiuscula*). The whipworm of the dog and fox is quite common in this country, being found in practically 40 percent of 300 dogs examined at Detroit by Hall and Wigdor, with an average infestation of over 21 worms. The worms have a slender anterior portion which is about 3 times as long as the thick posterior portion. (Fig. 22). They are from 4.5 to 7.5 cm. long.



Fig. 22. *Trichuris vulpis*. Female. Enlarged. From Fiebiger, 1912.

The embryos develop in the eggs and require a rather long time for development, about 5 months in Railliet's experience. When embryonated eggs are swallowed by a suitable host, the young worms apparently develop in the cecum and do not enter the circulation. They mature in the course of three months.

These worms not infrequently give rise to a low grade inflammation at the point of attachment, usually at the tip of the cecum. The anterior end of the worms is sewed in the mucosa, thereby impairing its integrity. In man, a related species appears to cause symptoms of distress and the same may be true of dogs.

It is difficult to remove these worms by anthelminthic medication, owing to the fact that drugs passing the ileo-colic valve of the dog may not enter the cecum. To ensure entry it would appear necessary to use such treatments as the use of repeated doses of some drug which is not a gastro-intestinal irritant, such as santonin, giving it daily for a week, suspending treatment for a week, and then repeating for a week, this treatment to be continued until the feces are negative for whipworm eggs. These lemon-shaped eggs are easily distinguished from the eggs of most worms commonly present in dogs in this country. Another method of ensuring the entry of a drug into the cecum is to use a bulky anthelmintic of low toxicity. The latex of a South and Central American fig, *Ficus laurifolia*, given in large doses, is used for the removal of these worms from man in South America, the latex being known as *leche de higuero*. Unfortunately this substance does not keep well and as yet it does not seem adapted to export for use outside of countries where the tree grows. Another method of attack would be to use rectal injections after the manner of gastro-intestinal lavage in the dog, using some anthelmintic solution. Hall and Wigdor found that gastro-intestinal lavage with water or water and soap alone removed all the whipworms from 2 dogs and left all the whipworms in 2 other dogs. The addition of an anthelmintic substance might make this lavage treatment effective for whipworms. Dr. Campbell writes me that Dr. Quitman has used a turpentine-soap or turpentine-acacia emulsion for lavage. Another solution of the matter is that proposed by Miller, namely, the surgical removal of the cecum. For most dogs the cost of such an operation would not warrant this procedure and it seems that with light infestations the injury from the worms would be less than from the operation. Moreover, where dogs are heavily infested, the worms, which in light infestations are clustered about the tip of the cecum, are distributed throughout the cecum and along the upper colon, and the surgical removal of the cecum would not remove the worms from the colon or make the dog, in all probability, immune to further infestation.

Prophylaxis is essentially a matter of sanitation and cleanliness.

Capillaria lineare. This worm, one of the relatives of the whipworm, was described by Leidy from the intestine of the cat in this country, probably at Philadelphia, and does not appear to have been found since. The male is 3.75 cm. long and the female 5 cm. long. For practical purposes we may assume that

the life history and prophylaxis are probably very similar to those for the whipworm. Nothing is known in regard to treatment, but the worm is not known to be of any such importance as to make this a matter of practical interest.

Capillaria aerophila. The lung hairworm of carnivores has been reported by Chandler as present in 7 of 27 cats examined in the United States, apparently in Michigan. It is also a common parasite of foxes in the United States and Canada and as it occurs in the dog elsewhere it seems reasonable to suppose that it occurs in this host in this country. The worms are very slender, the male being 2.4 cm. long and the female 2.5 to 3.2 cm. long.

At the present time the life history of this worm is unknown. The adult worms live in the air passages of the lungs and the eggs are coughed up and swallowed, passing out in the feces for the most part. Under favorable conditions an embryo develops in the egg and animals are doubtless infected by swallowing such embryonated eggs. How the young worms make their way to the lungs is not known, but it may be assumed that they enter the blood vessels in the walls of the digestive tract and leave the blood vessels for the air passages of the lungs.

These worms may cause catarrhal changes in the lungs and in heavy infestations the bronchi may be occluded by masses of worms. The eggs of what appear to be these worms have been found in the nasal discharges. Chandler reports that infested foxes wheeze, especially after running, and may have a choking cough and running at the nose.

Good food and nursing treatment is probably the best method of handling an infested animal. Prophylaxis consists in sanitary measures, and especially cleanliness.

Trichinella spiralis. Trichinae occur in a large number of hosts, including the dog and cat. Hall and Wigdor report the experimental production of these worms in the dog at Detroit, but we do not recall any record of the natural occurrence of the worms in the dog or cat in the United States. It is possible that these worms are not as uncommon as our lack of records would indicate, the lack of records in the case of these animals being for the most part due in this country to the lack of examinations for parasites and a failure to publish the findings when examinations are made. In Denmark, Høyberg in 1906 found 6 cases of trichinae in 500 dogs (1.2 percent) and 5 cases in 100 cats (5 percent). Fiebiger states that in Saxony trichinae have

been found in 0.5 to 1.4 percent of dogs, and only in 0.023 percent of the swine, which distinctly reverses the relations of these animals to trichinae as we commonly conceive of these relations. It would be of interest to see what a microscopic examination of a series of dogs for trichinae in this country would show. We know that rats harbor trichinae and that some dogs and many cats catch and eat these rodents. In this connection it should be remembered that the larvae of *Belascaris marginata* may occur encapsulated (Fig. 24) in the liver, kidneys, muscles, brain, etc., of dogs, as Fülleborn has shown, and that these larvae may be mistaken for trichinae.

The life history of trichinae needs only a bare outline. If meat infested with larval trichinae is eaten by a suitable host, the larvae develop to adults in the intestine of this host and the female worm deposits live embryos in the lymph spaces of the intestinal wall. These embryos are carried throughout the body by the blood after reaching the blood vessels, and develop to encysted larvae in the voluntary musculature.

Although trichinae are markedly pathogenic for man, they appear to cause but few symptoms and little distress in the case of dogs and cats.

Toxascaris limbata. Ascarids belonging to this species or to a related species, *Belascaris marginata*, are very common in the United States, being found by Hall and Wigdor at Detroit in over 53 percent of 300 dogs. Apparently one of these species may predominate in some places and some years and the other species in other places and other years. *T. limbata* can be differentiated from *B. marginata* by the fact that in the former the vulva of the female is at the union of the anterior and middle thirds of the body, and the genital tubes, which can be seen through the body wall, do not extend anterior to the vulva, whereas in *B. marginata* the vulva is near the union of the anterior fourth of the body with the posterior three-fourths, and the genital tubes extend anterior to the vulva, usually into the anterior ninth of the body. They may also be differentiated by the presence of a posterior bulbous portion in the esophagus of *B. marginata*, which is lacking in *T. limbata*. (Fig. 23).

The eggs of these worms pass in the feces and embryos form in them under favorable conditions in the course of 2 or 3 days. When such eggs are swallowed the young worms hatch and make their way to the lungs, where they enter the air passages and are swallowed, developing to adult worms in the intestine. Ac-

cording to Fülleborn, there are apparently certain differences in the life history of this species and of *B. marginata*. He failed to produce intrauterine infection with *Toxascaris* under conditions similar to those under which intrauterine infection occurred in the case of *Belascaris*; he finds *Toxascaris* less common in pups than in *Belascaris* and more likely to be present in older dogs; and he finds *Toxascaris* less disposed to encyst in the host tissues in its larval stage.

In a general way, ascarids of all sorts are especially injurious to young animals. They appear to act as irritants to the sensitive mucosa of the delicate digestive tract of the young animal, causing derangements of appetite and digestion. In young animals they may be present in enormous numbers, Hall and Wigdor having reported 2000 from one pup in a case of natural infestation. In such large numbers they often cause occlusion of the intestine, and when present in large numbers they are apparently most disposed to wander to unusual situations, such as to the stomach, bile ducts, pancreatic duct, esophagus, nares, eustachian tubes, trachea and other tubes and cavities. In these situations they give rise to grave accidents at times, the nature of the injury depending on the site of infestation. Death is not an uncommon sequel in the case of pups and young dogs. We have too little information as yet to furnish exact information in regard to the damage caused by the passage of these worms through the lungs, but the effects observed in pigs indicate that such damage probably takes place in dogs in some cases of heavy infestation.

The most effective drug for the removal of ascarids from dogs is oil of chenopodium. For the purpose of removing these worms it may be given in doses at a rate of 0.1 cc per kilo (2.2 pounds) of weight, or 1 cc for a dog of average size (22 pounds). To protect the dog from the constipating and toxic effects of this drug, the animal should be given at least an ounce of castor oil immediately preceding or following a dose of 1 cc or less of chenopodium, and a larger amount of castor oil should be given with larger doses of chenopodium. While chenopodium is a fairly satisfactory drug, having an unusually high degree of efficacy in removing ascarids from dogs, it has not a large margin of safety, the lethal dose being at the rate of 0.5 cc per kilo, or 5 times the therapeutic dose. Because of this some veterinarians prefer santonin and calomel. If santonin is used, it should be given in repeated small doses for several days.

rather than in one large dose, as experiments and experience show that it is distinctly more effective if given in repeated doses. Some veterinarians prefer to use carbon tetrachlorid for removing ascarids from dogs. This drug is slightly less effective than chenopodium in removing ascarids, but if given in the dose advocated for removing hookworms it will remove all or almost all of the ascarids present in the great majority of cases and is much safer than chenopodium. The safety factor found by Hall and Shillinger for this drug, as previously noted, may be as high as 53, or over 10 times the safety factor of 5 for the therapeutic dose of chenopodium as compared with the lethal dose.

Prophylaxis for ascarids in dogs is a matter of sanitation and cleanliness, with especial precautions to protect pups for the first few months of life. According to Pagels, the greatest number of ascarids occurs in dogs 41 to 50 days old; from the fifty-first to the seventieth day many ascarids pass in the feces, and at the age of 71 to 90 days pups have on an average 15 to 17 ascarids. Sanitary measures have been found extremely effective in controlling roundworms of swine, and such a sanitary system, developed in the Bureau of Animal Industry and known as the McLean County System, has received extensive test in McLean County, Illinois, where it has effected great savings in the pig crop. Some modification of this system might be applied with great benefit to the raising of dogs.

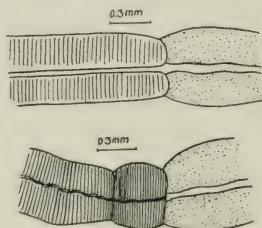


Fig. 23. *Belascaris marginata* (left) and *Toxascaris limbata* (right.) Union of esophagus and intestine, showing bulbous enlargement in *B. marginata*. Enlarged. From Wigdor, 1918.

Belascaris marginata. The morphology and life history of this worm (Fig. 23) have been indicated in the discussion of *T. limbata*. Fülleborn has produced intrauterine infestation of pups with *B. marginata*, and finds that the larvae have a tendency to form worm knots of encapsuled larvae (Fig. 24) in the liver, kidneys, muscles, etc. Apparently larvae which fail to

enter the air passages of the lungs and are carried back to the left side of the heart may behave as do trichinae larvae, leaving the capillaries of the systemic circulation and encysting in the tissues. For the most part the pathology, treatment, etc. are similar to these things for *T. limbata*.

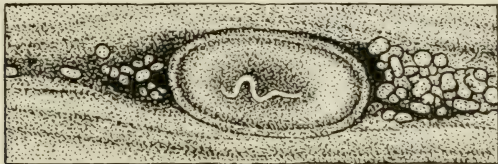


Fig. 24. *Belascaris marginata*. Encysted larva in diaphragm of dog. x 40.
From Fuelleborn, 1921.

Belascaris vulpis. This species, a parasite of foxes, was reported from the dog by Rudolphi at a time when ascarid species were not well differentiated and has since been reported from this host by Walton. Both records are open to suspicion of error on the evidence or lack of evidence, but presumably this parasite would develop in dogs. Jeffreys has reported this species from foxes in the United States, but did not publish a description or evidence on which to judge this report. This species is very similar to *B. marginata*, but the posterior extremity of the male body has a trough-like depression and is almost triangular in cross-section. Little of a definite sort is known about the habits of this worm, but we may assume that in general it behaves as does *B. marginata*.

Belascaris cati (*Belascaris mystax*). This is the cat ascarid, a worm shorter than *B. marginata*, which attains a length of 18 to 21 cm., and more slender than *T. limbata*, which rarely exceeds 10 cm., the length of *B. cati*, in length. The cephalic alae of *B. cati* are straight in front and rounded posteriorly and are quite conspicuous.

In general these worms behave as do the dog ascarids already discussed. They are more common in kittens than in older animals, but Lentz has found them in cats 10 and 12 years old. They may be removed by the use of chenopodium, santonin or carbon tetrachlorid, but all of these drugs are more toxic for cats than for dogs, chenopodium being twice as toxic for cats.

Oxyuris compar. This worm was reported as a parasite from the small intestine of the cat in this country by Leidy. A con-

sideration of his description has led the writer to the conclusion that Leidy was dealing with *Oxyuris ambigua*, a common parasite of the large intestine of the rabbit in this country. If this view is correct, Leidy's name should be dropped into the synonymy of *O. ambigua* and the record regarded as a case of pseudoparasitism due to the finding of a rabbit parasite in the small intestine of a cat that had a short time previously eaten the intestines of an infested rabbit.

THORNY-HEADED WORMS

Oncicola canis. The American thorny-headed worm of the dog occurs in Texas, and Ward has reported one case from Nebraska. These are small worms, the female 1.4 cm. long and the male smaller. They occur as adults in the small intestine of the primary host. Van Cleave has reported the larvae of this species from the armadillo. It seems probable that the intermediate host of this worm is an arthropod and that the larvae in the armadillo represent forms occurring in an unsuitable host. Little is known in regard to the pathology of the worm. Parker reports one dog as having 300 of these worms present.

Little seems to be known in regard to treatments for thorny-headed worms. Calandruccio has reported that he was successful in relieving himself of an intentionally acquired infestation with an echinorhynch, *Moniliformis moniliformis*, by the use of male fern, and this drug would therefore be indicated as worth trying for the purpose of removing these worms.

Echinopardalis pardalis. This parasite of the cat and of numerous wild species of cats has been reported from the cat in the United States once by Curtice under the synonym *Echinorhynchus campanulatus*. This species is larger than the one just discussed, being from 3 to 4 cm. long. Nothing appears to have been reported in regard to its life history, pathology or treatment.

TONGUE WORMS

Linguatula serrata (*Linguatula rhinaria*). These worm-like animals are regarded as degenerate arachnids, the group including spiders, ticks, etc. They live as adults in the nasal fossae of the dog, fox and several other animals, and they have been reported as larvae from the liver, lungs and lymphatic glands of a number of animals, including the cat. Cattle are quite commonly hosts of this parasite in the Southern United States. In Europe sheep are the common hosts of the larvae. The adult male is 18 to 20 mm. long and the entire body has annulations

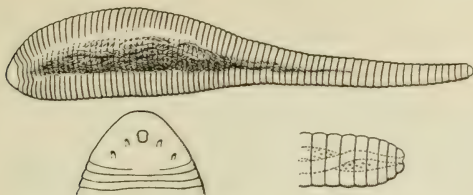


Fig. 25. *Linguatula serrata*. Upper figure, entire animal. Enlarged. Lower left hand figure, head. Enlarged. Lower right hand figure, female tail, showing utero-vagina (dotted lines) and intestine (solid lines.) Enlarged. From Sambon, 1922.

of almost uniform width. The female (Fig. 25) is 8 to 10 cm. long and the annulations are longest towards the third fourth of the body from the anterior end. Apparently the adult of this species has never been reported up to present time from the United States. However, this August the writer was supplied with a specimen of this parasite by Dr. F. F. Russell, the specimen having been collected from a dog in Atlanta, Georgia. Aside from the fact that this specimen, a female, appears to be the first adult specimen recorded as collected from the dog in the United States, there are other circumstances of interest in this connection. The dog from which the specimen was collected was a case of what we may call the "running disease," or "running fits," which has been so prevalent in the South this year. This disease has received but little attention in the veterinary journals, apparently because the veterinarians who were seeing cases of the disease were at a loss to account for it and had little of a positive sort to contribute to the subject. The dogs in question displayed various symptoms, but the most common and striking was a disposition to suddenly bolt, running wildly for a variable period of time and sometimes running through screen doors or into persons who blocked their paths. The attacks came on periodically, the animal apparently being normal between these periods. Apparently the disease was most prevalent in Virginia during May and June, according to Dr. E. S. Allen of Chatham, Virginia, though there were sporadic cases of the disease in August and cases were occurring in North Carolina in July and perhaps later. (Subsequently cases were reported from Ohio and elsewhere.)

In this connection it may be noted that the tongue worm is said by Railliet to rarely cause epileptiform or rabiform attacks. It has seemed possible to the writer that the occurrence of such

symptoms as are presented in this "running disease" might be noted in the case of some dogs in a year in which for some reason there were an unusually large number of these parasites present in dogs. The larvae are quite common in the livers of cattle in the South and the fact that the adult has not been reported from the nostrils of the dog is only evidence of the fact that very few dogs have been examined for parasites in the South, and of these even fewer have been examined to see if there were parasites in the nostrils. These tongue worms are too large to readily overlook if the nostrils are opened and examined, but in the failure to open the head or slit the nostrils, considerable numbers of large parasites may be overlooked for long periods and only found by accident. This disease appears to be a quite new thing and anything that might seem to throw any light on it appears worth investigating. That tongue worms might have some connection with such symptoms as have been observed is, of course, merely a hypothesis. Other worms have been accused of causing rabiform symptoms in the dog, among them being *Taenia echinococcus*, *Spirocerca sanguinolenta*, *Dirofilaria immitis*, *Diocotophyme renale* and *Ancylostoma caninum*. While some of these might also be overlooked by veterinarians making a postmortem examination, there appears to be more likelihood of overlooking the tongue worm. "Running disease" has been regarded by some veterinarians as a symptom of a nervous form of distemper, of anal abscess, and of other conditions.

The eggs from the female tongueworm in the nostrils of the dog pass out in mucus or are swallowed and pass out in the feces. When such eggs are eaten by suitable hosts, as by herbivores in grazing, the larvae make their way to the liver, lungs and lymph glands, as a rule, and there develop to the infective stage. When dogs swallow larvae in infested tissues, the dogs become infested with the adult tongueworms, but just how the larvae get to the nostrils of the dog is yet a debatable question.

As regards treatment, Railliet states that it should consist in the injection of parasitocidal substances into the nostrils. What substance to use does not appear to have been determined by anyone. In view of the fact that the larvae and adult of this parasite may occur in man, it would appear that unless a treatment left no doubt as to the removal of all parasites present in an infested dog, it would seem advisable to kill the dog.

Prophylaxis is a matter of proper meat inspection with the

disposal of all diseased portions of carcasses in such a way that dogs would not have access to them.

SUMMARY

In this paper the writer has discussed the internal parasites of the dog and cat which have been reported from the United States and its possessions. In some cases the parasites have been reported in the United States only, from some other host and not from the dog and cat, but their occurrence here in any host has been regarded as warrant for mentioning them.

The number of parasites reported is considerable, a total of 47, including the following: Flukes (*Paragonimus westermani*, *Amphimerus pseudofelineus*, *Opisthorchis wardi*, *Parametorchis complexus*, *Cotylophallus venustus*, *Cryptocotyle lingua*, *Alaria americana*, and *A. michiganensis*); tapeworms (*Diphyllbothrium latum*, *D. americanum*, *D. mansonii*, *Mesocostoides lineatus*, *Taenia taeniaeformis*, *T. balanicaps*, *T. pisiformis*, *T. hydatigena*, *T. ovis*, *T. krabbei*, *Multiceps multiceps*, *M. serialis*, *Echinococcus granulosus*, *Dipylidium caninum*, and *D. sexcoronatum*); roundworms (*Strongyloides stercoralis*, *Ostertagia circumcincta*, *Dirofilaria immitis*, *Spirocerca sanguinolenta*, *Physaloptera rara*, *Diocotyle phyme renale*, *Ancylostoma caninum*, *A. duodenale*, *Uncinaria stenocephala*, *Necator americanus*, *Ollulanus tricuspis*, *Trichuris vulpis*, *Capillaria lineare*, *C. aerophila*, *Trichinella spiralis*, *Toxascaris limbata*, *Belascaris marginata*, *B. vulpis*, *B. cati*, and *Oxyuris compari*); thorny-headed worms (*Oncicola canis* and *Echinoparadalis pardalis*); and tongue worms (*Linguatula serrata*). This list will probably exceed 50 before long, as the writer has been informed of the occurrence of other parasites which cannot be published at this time without infringing on the rights of the persons communicating these findings.

NATURAL VERSUS SYNTHETIC SALICYLATES

There are a few veterinarians and physicians who still think that the natural salicylates are superior to the synthetic.

The Council on Pharmacy, of the American Medical Association, has made a thorough study of the relative value of these, and they report that "There is no difference between the natural and the synthetic product, so far as observable results are concerned."

This is important to veterinarians, because the natural salicylic acid is much more expensive than the synthetic.

SOME TROUBLES MET IN IMMUNIZING AGAINST HOG CHOLERA¹

By E. R. STEEL, D.V.M., Grundy Center, Iowa.

It is the object of this paper to discuss from a practitioner's viewpoint some of the troubles met in immunizing against hog cholera and to consider means of overcoming them. The following topics will be reviewed then, only in their relation to immunization: vaccination of suckling pigs; proper age, size, and condition to vaccinate; wormy pigs; pigs with ulcerative enteritis; hog flu; swine plague infection; serum-alone treatment; administration of serum and virus; handling of serum and virus and keeping a record; is all U. S.-inspected serum and virus of the same merit; finally, cost of immunization. If we did not have to consider these factors, truly immunization against cholera would be fool proof. My experience with serum and virus has been both in practice and in production for a short time at the University of California. However, what I say is not official from that institution, but rather from my own observations.

As to what the reaction is that produces immunity to cholera, there is little known. Potent serum, plus virulent virus, plus pig equal immunity, some believe. Another factor—susceptibility, may enter into it; at least, clinical evidence would indicate that it is necessary to consider it, if we are to secure as near 100% immunity as is possible to attain by vaccination.

VACCINATING YOUNG PIGS.

Regarding immunization of suckling pigs, a review of the published data will reveal that it is not safe to adopt it as routine practice, and my own observations corroborate this conclusion. Cahill¹ reports:

"852 pigs weighing 15 to 30 pounds were given 30 cc of serum and 2 cc of virus. That from 52 to 72% of pigs so treated failed to carry sufficient immunity to protect against the disease when exposed to a really virulent infection a short time afterwards."

The pigs were fed garbage which is a virus-carrier, according to Birch². I, myself, have hyperimmunized hogs, from several garbage plants, that had never been injected with a drop of serum or virus. I placed some test-pigs in one of these herds, telling the owner to let them get used to the garbage feed and then try to kill them with their "garbage sickness." They didn't sicken.

¹Read before the Missouri Valley Veterinary Association, St. Joseph, Mo., February 13-14-15, 1923.

Later, I vaccinated "country fed" hogs and put them in the garbage-pens with the same results. They were hogs vaccinated at from 60 to 100 pounds. Cahill's pigs, even though given virus and fed virus-meat, did not acquire a uniform immunity. That pigs given serum-alone, as he reports in the same article¹, retained immunity for six weeks, whereas pigs so treated in the Middle West retained their immunity only three weeks, may possibly be explained by the fact that they were constantly exposed to cholera in the garbage feed. Birch², of the New York State Experiment Station, also thinks that simultaneous immunization of young pigs can not be recommended. Kinsley⁴ writes:

"In several instances there has been cholera developed in swine that had been simultaneously injected with serum and virus before they were weaned. It may be that an immunity produced in a suckling pig will endure in a considerable percentage of cases until the swine are fattened and marketed, provided there is no virulent outbreak of hog cholera in the immediate vicinity, but it is problematic whether a suckling pig's immunity will be sufficient for breeding purposes."

For my own observations in this problem of immunizing suckling pigs, I will cite cases from my records:

May 31, 1921, I vaccinated with the simultaneous treatment 47 pigs for Mr. S. Sows immune and pigs three weeks old. Used 3 cc of virus. July 18, 1921 (7 weeks later) 10 were sick and later died and showed evidence of cholera. Oct. 7, 1921, more pigs sick and I re-vaccinated the herd of which there were 32 left. Every pig that got sick died, and those I posted showed lesions of cholera. After re-vaccination, no more losses.

September 26, 1921, I vaccinated 109 pigs for Mr. T., of which 49 were suckling pigs on immune mothers that I had immunized the year before, when they weighed about 100 pounds. I did not re-vaccinate the mothers. Pigs were given 3 cc of virus and serum 25 cc. None died while suckling, but every one died within a short time after weaning. The herd was badly infected with cholera and about half the herd died. Immune sows did not sicken and the older weaned pigs vaccinated at this time of treatment did not break later.

May 3, 1922, vaccinated 109 pigs for Mr. K. June 23, called to see the older hogs, vaccinated the year before as sucklings. Cholera symptoms and lesions were evident. Re-vaccinated sows after seven had died. Thirty of 50 of their pigs also died. Three sows vaccinated at the same time as the other sows, only older, were left untreated and they did not sicken.

In talking to serum-producers, I find some of them say that in hypering from farms where suckling pigs have been simultaneously treated, many of the hogs will not stand hypering, whereas hogs vaccinated on the same premises as older weaned pigs do stand hypering.

On the other hand, I have vaccinated with the simultaneous treatment, a few herds of suckling pigs, and later the boars were sold into cholera herds in which only the boars survived. I have not noted any breaks in pigs on non-immune sows, although my experience in this has been limited. I have avoided immunizing

suckling pigs, for after all, it is not a great saving, for many suckling pigs do not live to weaning age anyway. In infected herds I have used the serum-alone treatment, re-vaccinating with the simultaneous treatment after weaning, and under these conditions, I advise early weaning and immunization as soon as pigs are in good condition.

In favor of suckling-pig immunization, we have the work of Niles and Rietz⁵ in which they report:

"171 pigs inoculated on the Station premises and on farms, when 7 days to 6 weeks old, and exposed to hog cholera (injecting each with 2-5 cc of virus) 5 months to 9 months and 26 days later, were found without exception to be immune to hog cholera. There was no difference in immunity in pigs from immune or non-immune sows."

This experiment only carried the test to market age and did not show that the immunity lasted for life, which is the test the practitioner must meet in his immunization work. I note also that in the four experiments on pigs on non-immune sows, that the pigs in all but one litter (of 6 pigs) did not weigh at time of inoculation the second time, what they should at their age; but it is explained that this was a coincidence of infestation with worms and effects of cold weather. However, stunting of pigs by vaccination is one of the drawbacks ascribed to immunization of suckling pigs. Pickens, Welch and Poelma⁶, in discussing the work of Cahill, and of Niles and Rietz, explain:

"It is the fact that the pigs used by Cahill were fed on a garbage diet and hence were under exposure to extreme infection practically all the time. The animals of Niles and Rietz were not garbage-fed and hence did not need the same degree of immunity for their protection. In another experiment which we are conducting, under conditions comparable to those on the average farm, our findings to date coincide with those of Niles and Rietz. Undoubtedly they would not hold in a garbage feeding plant."

Now, sometimes in the field, hogs vaccinated by a practitioner are subjected to very virulent outbreaks of cholera, and even eat hogs dead of cholera, and are kept in yards in which cholera-infected hogs are put from time to time, and they do need a solid immunity to stand the field tests. Considering the data published on the subject of immunizing suckling pigs and experience in the field, I believe the routine practice of simultaneously treating suckling pigs can not be safely recommended at this time.

Then, what is the proper age, size, and condition to attempt immunization? I have considered susceptibility to virus as a possible factor in securing a solid and as near 100% immunity as it is possible to attain by vaccination. In inoculating virus-pigs, I noticed that pigs 50 to 90 pounds and in good condition proved

the most uniformly susceptible. In talking to other producers, I have been told that this is usually their experience. Experimentally, Pickens, Welch, and Poelma⁶ showed that:

"Many pigs born of and suckling immune mothers, from ages 2 to 55 days, withstand exposure to one cc of hog cholera virus. Most pigs weaned at ages 48 to 78 days, which have been born of immune mothers, usually contract hog cholera after exposure to one cc of virus when not previously immunized."

On the other hand, Dimock⁷ writes:

"The best time to vaccinate pigs is when they are from eight to sixteen weeks of age, or ten days after weaning. However, on infected premises, it is necessary to vaccinate the pigs at from 2 to 4 weeks of age. When this is done, it is advisable to revaccinate, by the serum-virus method, six to seven weeks later on after weaning. Suckling pigs, even from immune sows, if on badly infected premises, will frequently contract the disease."

Following immunization of thrifty, weaned pigs, I have injected them monthly with 10 cc of virus, and later hyperimmunized them without losses. Serum companies often purchase their hypers from feeders who are constantly vaccinating additions to the herds, or having cholera exposure at intervals, and in this way they think the immunity is strengthened, for they find the ordinary, vaccinated hogs that have not been exposed to cholera since immunization sometimes break from hypering.

In the field I have never given additional virus to avoid breaks, for by selecting thrifty, weaned pigs I have had no trouble with breaks even though the hogs have been exposed to virulent outbreaks, two or three years after immunization. I have never had to revaccinate a herd and I have had the satisfaction of having seen hogs that I had immunized, the only animals to survive in cholera herds in many instances. However, one herd of runty, starved pigs, vaccinated September 30, 1920, broke Nov. 12, 1920, and of 40 pigs all but 15 died. I had advised against trying to immunize this herd, telling the owner they probably could not be immunized for they might not react to virus. Six sows treated at the same time, with the same serum and virus, did not break. Susceptibility may be a factor in immunization.

Birch³ believed that natal immunity may be a factor both in pigs from immune and non-immune sows. He writes:

"Clinical experience teaches that we cannot always depend on the uncertain natal immunity to protect pigs, either of immune or susceptible mothers, until weaning time, and it teaches also that pigs given simultaneous treatment before weaning do not always thereby acquire a lasting immunity . . . and we know in general terms that active immunity can be produced only in animals that at the time of immunization are susceptible to the particular disease against which we seek to immunize. We know also that pigs given the simultaneous treatment, after they have attained an age when all can be regarded as susceptible, are rendered permanently immune by the treatment. It is inter-

esting to observe that although natal immunity and serum-alone immunity in young pigs are regarded as being of the passive type, there appears to be a distinct difference between the two: if virus and serum are given while natal immunity still persists, active immunity is not conferred; but virus and serum, administered during the existence of passive immunity due to serum alone, usually, if not always, produce active immunity."

After preparing charts showing susceptibility of young pigs to cholera, he concluded that 12 weeks was the minimum age that he preferred for giving the simultaneous treatment. Although natal immunity in garbage-fed hogs is stronger than in country-fed hogs, this coincides with observations in the Central West, for generally speaking, cholera does not develop until after the weaning age.

In a recent paper entitled, "Natal and Artificial Immunity of Young Pigs to Hog Cholera," Birch¹⁵ writes:

"There are certain points in regard to susceptibility of young pigs of susceptible sows that have not yet been cleared up. In a considerable number of outbreaks of hog cholera in which there was no record of previous immunization, we have observed the very young pigs showing much greater resistance to the disease than older animals and this observation has been made in so many instances that we have been led to wonder whether this apparent immunity was due to the difference in feeding habits of the sucklings as compared to those of older animals.

The usual conception of immunity in the new-born is that it is transferred from the mother to the young either thru the placenta or thru the milk. The latter method is regarded as by far the most universal, but in those instances in which the mother is susceptible and the young appear to be temporarily immune, this immunity cannot be explained on such a basis. There appears to be some feature regarding immunity of the new-born which is not well understood, and this applies to infectious diseases other than hog cholera."

In selecting thrifty, weaned pigs for immunization, losses may be avoided if the unthriftiness is due to worms, ulcerative enteritis, or other devitalizing influences. I have tried to get my clients to let me see the pigs a few weeks before they wished them vaccinated and I offer this service free. Some of the herds we are called to treat should not be vaccinated for weeks and I have so advised the owner. This last summer, I treated approximately three thousand pigs for worms before immunizing them. I also treated 578 pigs in 8 herds the next day following vaccination giving a combination, santolin-and-oil-of-chenopodium tablet, followed the next morning by two ounces of Epsom salts, in the slop, per pig. No losses occurred and the pigs certainly did well following. I believe it can be done safely if done early, before the reaction to virus.

I also try to stay out of herds having ulcerative enteritis; but I do run into it sometimes. Parts of herds may have it and then, too, if cholera is suspected, vaccination is necessary. I prefer the simultaneous treatment and I increase the dosage of serum 10

cc in apparently healthy pigs and 20 cc to those in the herd visibly affected with it. In a few instances I have treated part of badly infected bunches of pigs, in the same herds, with serum and virus, and part with serum alone, and it has so happened that the serum-alone hogs had the larger percentage of losses. Of course, the pigs were dying anyhow, but the virus did not seem to increase the death rate where the increased dose of serum was used. The label dosage of serum can not be followed without discouraging results. As regards the use of virus in this condition, I was unable to find any definite data published. Jacob⁸ gives as his opinion:

"It is extremely dangerous to use virus in an attempt to immunize against cholera until after necrobacillosis infection has been eradicated. This no doubt explains the frequent loss of pigs when a herd is treated with serum and virus, while at the same time results with older and more thrifty hogs are good."

My experience with so called necrobacillosis has been limited to ulcerative enteritis in which multiple ulceration of the mucosa of the large intestine is seen and the pigs show chronic scours. I have not observed it as Dreher⁹ reports, in which diffuse necrosis of the mucosa, with membrane formed almost occluding the lumen of the intestine has developed. As routine practice the immunization of pigs with ulcerative enteritis should not be followed if avoidable, for such pigs may stay unthrifty and losses occur and the vaccination will get the blame. If possible it is better to wait to immunize until the herd is straightened out by intestinal antiseptics, change of lots, and better nutrition by use of slops.

Another condition that causes trouble in immunization is pneumonia, swine plague, hemorrhagic septicemia, or mixed infection as it is variously called. Although I have seen this condition as a herd-disease, its associations were such that cholera as a primary devitalizing influence could not be eliminated. I have never had it appear in any herd which I have immunized when the pigs were well and thrifty at time of vaccination. That it is secondary to cholera, there is no dispute. I have noted that in injecting pigs with virus in the laboratory, some herds of virus-pigs will develop it more than others, although the same serial of inoculating virus is used. To me, this condition is secondary to some other devitalizing influence and cholera is by far the most important, although it may be influenced by drafts, chilling, parasitic infestation, and hog flu. I have seen hundreds of hogs die following a diagnosis of mixed infection or hemorrhagic septicemia, and bacterins used in one or more injections. In fact,

the farmers in my community call it "missed infection," because the real cause of death—hog cholera—was not eliminated by vaccination. I have observed it in herds not given enough serum, or given low-potency serum, or later, when the virus was probably not all active, and following serum-alone treatment. Birch¹⁰ states:

"It is true that there are many influences and contributing factors connected with 'breaks' following simultaneous treatment, but if we could eliminate the part played by the filterable virus in such cases we would be a long way on the road toward clearing up some of the problems that now trouble us."

In immunizing herds in which sporadic cases of pneumonia have occurred, I believe it is a real factor that must be reckoned with, and I think that an increase in the dose of serum to all animals in the herd will eliminate to a greater degree the development of these cases following immunization than the administration of mixed infection bacterin along with the simultaneous treatment. I have not found bacterins of apparent value in preventing or curing this disease. Eliminate devitalizing influences and it will take care of itself. I admit there are farms on which the raising of small pigs is very discouraging to the owner and perplexing to the veterinarian. However, I have found that the breeding of the sows, so that the pigs will come all within a few weeks, and thus prevent robbing by older pigs, the special feeding of runts, encouraging the use of alfalfa or clover pasture for small pigs, supplying warm, dry quarters, sanitary surroundings, weaning early and promptly, immunizing against cholera, using an increased dose of serum, has handled this problem on farms on which it was very doubtful that pigs could be raised and the owner had even considered going out of the hog business entirely. If this method is not accepted, older, thrifty pigs may be bought and immunized at once: Benner¹¹ says:

"Pigs have much less resistance to natural infections than do older hogs... .. We do not think it practical and economical to attempt to vaccinate against swine plague. The activities of *Bact. Suisepeticus* should be combatted by immunizing against cholera, by keeping infectious material, and that containing harmful parasites, away from the animals and keeping their resistance high by the practice of sane methods of swine husbandry."

Hog flu, also, must be considered in its relation to immunization against cholera. Low in mortality in itself, it is not dangerous unless cholera accompanies it. I have seen many herds wiped out entirely, the owner thinking he had only flu. In fact, during an extremely virulent outbreak of cholera in 1921, I observed only a few herds in which cholera symptoms were evident exclusively. The only way to eliminate cholera in flu herds, if cholera

is in the neighborhood, is by vaccination. The rapid spread of flu in a herd is a guide, but it is not certain. Also, post-mortem findings are not characteristic and will not eliminate the possibility of cholera. It is easy, in the virus laboratory, to post cholera pigs, but in the field I do not place reliance on lesions, for we find evidence in the same pig of several conditions. Along with autopsy, history, symptoms, elimination of other factors and judgment must be considered. In picking an autopsy pig, I prefer to choose one visibly sick, running a high temperature, off feed, just recently sickened, and not showing symptoms of pneumonia, thumps, diarrhoea or unthriftiness, for with these confusing conditions avoided, cholera may be diagnosed more easily.

From the first appearance of hog flu, I have recommended vaccination against cholera as the only safe means of eliminating that fatal disease, if it is in the neighborhood or on the farm. Due to an aversion to the serum-alone treatment, I have used the simultaneous method. In going over my records, I find I have vaccinated 4,000 hogs having flu. In no instance, except in herds that had been sick a few weeks, waiting for the hogs to get well, have I had losses greater than usually occurs with flu alone. If hog flu hangs on in a herd, cholera should be suspected as being associated with it; but if we wait to see if this occurs when cholera is in the community, it will allow the cholera to become established in the herd and bad results will follow.

I am convinced that the condition described by Jay¹², as possibly hog flu, is different from flu as seen in Iowa. Feed and exposure seem to have some predisposing influence, but I have found it very readily transmitted to other animals by association, many herds getting it from pigs brought home from fairs by pig-club boys, and spread from this center to neighboring farms, and down roads taking in communities. Jay's belief that "it was an anaphylatic condition and that metabolic changes were in progress that prevented cellular activity in the formation of antibodies injected with the virus of hog cholera ineffective," is not born out in my experience. I have seen several thousand immunized hogs sicken with the flu and with cholera in the community at the same time and even on the same farm, none of the herds I had immunized broke with cholera. In fact, immunized herds will go thru the flu better than those not immunized, it seems.

(To be continued)

THE USE OF THE STOMACH-TUBE IN SWINE PRACTICE¹

By C. E. JUHL, Osage, Iowa.

The stomach-tube has not been generally used heretofore in swine practice, but since oral swine-medication is limited almost entirely to the treatment of pigs for worms, and now that much of the vermifuge is given in oils, the pig stomach-tube can serve a very useful purpose in the future for the administration of these preparations. It is not difficult to pass a stomach-tube in the pig. In fact, the tube can be passed in pigs more easily and with more accuracy than can the tube in the large animals.

The principal difference that confronts one is the inability to palpate the esophagus in the pig, which method is quite generally used in the larger animals to determine whether the tube is entering this passage or the trachea. While most animals will cough, more or less, when a tube is passed into the trachea, they may not give this warning in time, when rapid work is being done, to prevent the administration of a dose of medicine into the lungs. The course of the tube can be determined very accurately, however, by noting the distance it can be inserted. For instance, if the tube enters the trachea it will go only about two-thirds as far as it would if it were passed into the esophagus.

By passing a tube into the esophagus of a dead pig weighing about sixty pounds, it was found that the resisting point was twenty-four inches from the most anterior part of the mouth. The resisting point, when passed into the trachea, was sixteen inches from this point. Measuring on the outside of the body it was found that the xiphoid cartilage was also sixteen inches from the anterior part of the mouth. Therefore, the xiphoid cartilage can be used as a landmark. If a tube is used that is long enough to reach beyond this point, and enough of it is inserted to exceed this distance, there should be no question about the course it is taking.

For pigs weighing from thirty to seventy-five pounds I find that a tube made from a one-eighth to a one-fourth-inch rubber hose (inside dimensions), that does not exceed one-half inch over all, and that is fairly soft and pliable, works very well. It should be at least twenty-four inches long. For smaller pigs a smaller tube should be used. One end of the tube should be equipped with an adapter for the large nozzle of a two-ounce, metal dose-

¹Read before the 35th annual meeting of the Iowa Veterinary Association, Des Moines, Iowa, January 17, 1923.

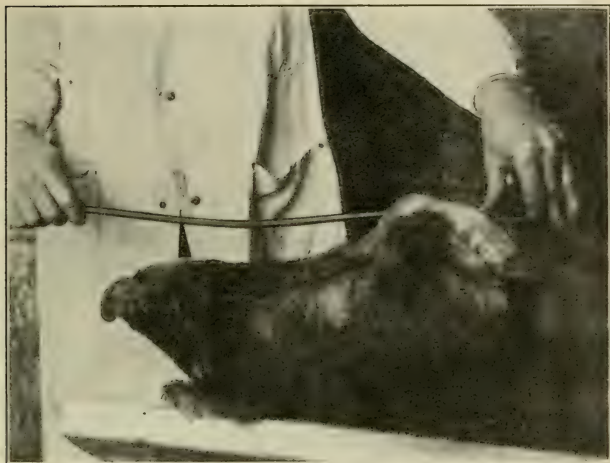


Fig. 1. Getting measurement for proper length of tube.



Fig. 2. Method of holding pipe and tube ready for insertion.

syringe. This will facilitate the administration of medicines through the tube.

As a director and guard for the tube, while it is being passed through the mouth of the pig, I use a one-half-inch iron pipe, ten inches long, one end of which has been curved slightly to make it conform somewhat to the contour of this passage. This curvature of the pipe, when properly placed within the mouth, directs the end of the tube onto the floor of the pharynx, which it follows backward, gliding over the glottis and into the esophagus. By taking this course the tube can not easily enter the glottis, an occurrence that at times is very difficult to prevent in passing the tube in the larger animals.

To pass the tube in the pig the animal is held, on its back, in a trough. For convenience the trough should be raised about three feet from the floor. One end of the tube is inserted into the straight end of the pipe and this end, together with the tube, at this point is grasped with one hand and the curved end of the pipe inserted into the mouth, to that place where it drops beyond the heavy part of the tongue. The other hand then clamps the jaws onto the pipe, sufficiently tight to hold it in position. This leaves the first hand free to manipulate the tube. If the head is fairly well extended, the tube will usually pass very easily and directly into the esophagus. It should be inserted far enough to make sure that it has not entered the trachea.

The tube, of course, must be of such size and flexibility as will allow it to pass freely and easily through the pipe, otherwise it will be difficult to distinguish between resistance at the end of the tube and friction on the tube within the pipe. The syringe containing the preparation to be administered is now connected up with the adapter and its contents injected through the tube, after which a small amount of water should be injected with another syringe to clear the tube of any of the preparation that it may have retained.

The tube can also be passed very easily in the mature hog. For this purpose I use a three-fourth-inch, iron pipe, twelve inches long, and a slightly larger and longer tube. The animal is left in the standing position. It is restrained by fastening a rope around its upper jaw and tying it to a post or other object. Another rope is tied loosely around both jaws. The pipe is then inserted into the mouth and a stick is used to twist the rope which clamps the jaws onto the pipe and holds it in position. The tube is then passed the same as in pigs.

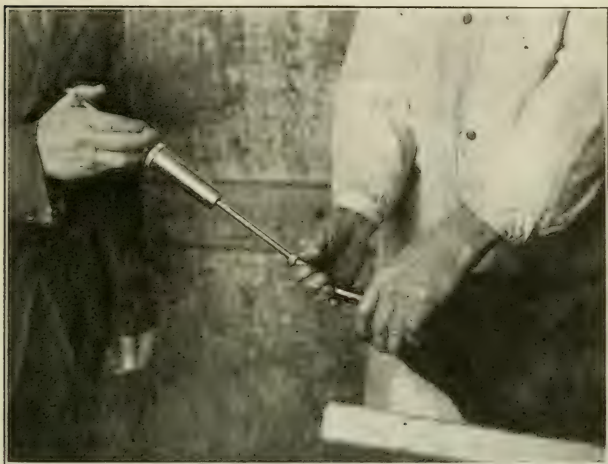


Fig. 3. Tube inserted and dose being administered. Method used for small animals.

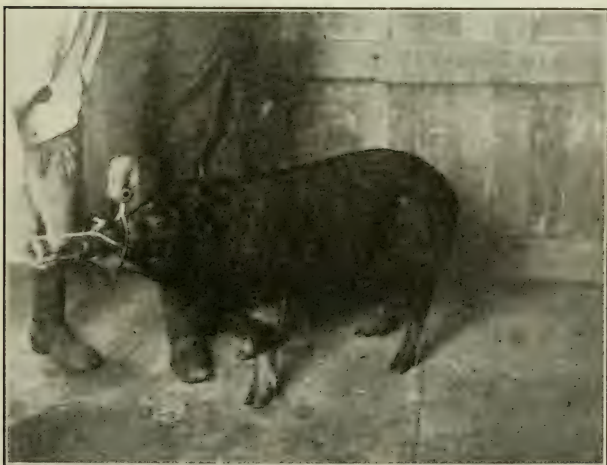


Fig. 4. Method of restraint for large animals.

OTITIS MEDIA¹

By W. F. GUARD, *Associate Professor of Veterinary Surgery,
Division of Veterinary Medicine, Iowa State College, Ames, Iowa.*

This condition has not been discussed to any extent, if ever, in veterinary surgery and its occurrence at first thought might seem quite rare to some of you. My own experience has been that the more I study the condition and talk to both veterinarians and breeders, the more prevalent I find it to be. Since beginning to investigate the condition we have observed it in the pig, cat, dog and calf, and can recall many cases previously observed which were undoubtedly affected with this condition but not recognized as such.



Fig. 1. Chronic suppurative otitis media.

We have frequently been called upon recently to diagnose and suggest treatment, if possible, for five or six pigs in the same herd affected with this condition in various stages of development, the owner stating that he had lost several the previous year showing the same symptoms. Fig. 1 illustrates four cases of chronic suppurative otitis media. Nos. 1 and 3, right ears affected. Nos. 2 and 4, bilateral cases which showed suppurative mastoiditis as complications on post-mortem. Nos. 1 and 3 were treated and are being used for other experimental purposes at present. In addition to this we have had opportunity to treat several cases

¹Presented at the Conference for Veterinarians held at Ames, Iowa, January 19, 1923 and also at the Missouri Valley Veterinary Medical Association Meeting at St. Joseph, Missouri February 12-14, 1923.

at the hospital from local herds, and before developing a method of treatment we had opportunity to study the pathology by post-mortem examination.

My attention was first attracted to this condition after having seen several hogs down on one side, unable to rise, and if passively turned to the opposite side would immediately flop over to the original position.

HISTORY

The history of these cases was usually as follows: The animal was first noticed holding its head to one side, gradually becoming worse until it walked in a circle toward the affected side, finally going down, unable to rise or even to lie upon the opposite side. These first cases were in the last stages of development and naturally the pathological lesions were quite marked, as will be

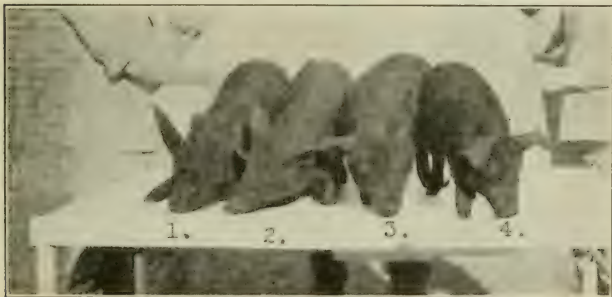


Fig. 2. Four cases of the chronic suppurative type.

shown by our autopsy reports. Fig. 2 shows four pigs in the advanced stage of the chronic suppurative type, complicated with mastoiditis, and No. 4 of this group shows meningitis also. These pigs show the poor general condition usually accompanying such cases and also the abnormal attitude of the head and ears. In Nos. 1 and 2 the left ear was affected, in No. 3 the right ear, and in No. 4 both ears were affected.

Later observations and studies convinced me that in these cases showing paralysis we were dealing with the chronic suppurative type of otitis media after meningitis had resulted as a complication. My first conclusion, therefore, was that if we were to treat these conditions successfully we should see them in the early stages before such complications occurred. With this in

mind we have had opportunity to study the condition in various stages of development and have observed the following types:

- I. The acute non-suppurative type
- II. Acute suppurative type with and without complications
- III. The chronic suppurative type with and without complications.

These conditions have been observed involving either one ear or both. The bilateral cases do not, as a rule, present the pathognomonic symptoms of the unilateral cases and require a little closer observation to diagnose. (See Fig. 2, No. 4.)



Fig. 3. Acute suppurative otitis media.

1. ACUTE NON-SUPPURATIVE TYPE.

Etiology and Pathology. We believe that in the majority of cases the exciting cause is an acute, nasal catarrh with an extension of the inflammation to the eustachian tube or its post-nasal orifice, causing a swelling of the tubal mucous membrane; thereby obstructing the tube and converting the middle ear into a closed cavity. According to W. T. N. MacKinnon, in *Clinical Medicine*, December 1922, "the air within the middle ear is absorbed and an exudation of serous fluid into the cavity occurs." At any rate, we find some of these early cases where a serous fluid only is found during the operation and we have been unable to demonstrate the presence of organisms either by inoculating tubes or by microscopic examination. In two herds where I recently observed this condition the owner stated that the herds

passed through an attack of "flu," just previous to the development of this condition.

Symptoms. In this type of the disease affecting one ear, the principal symptom is holding the head tilted to one side, with the affected ear down and drooped. In very severe cases the animal may walk in a circle, with the affected ear toward the inside of the circle. If this condition exists for any length of time untreated, it usually becomes infected, thereby changing to the acute or chronic suppurative type.

II. ACUTE SUPPURATIVE TYPE.

Fig. 3. This animal, according to the history, held its head tilted for about six weeks, then went off feed and was presented for treatment. At this time the temperature was 106 degrees, the animal was off feed, and the base of the ear was hyperemic and sensitive. Diagnosis—acute suppurative otitis media, the termination of a chronic otitis media. The tympanic membrane



Fig. 4. Otitis media in a calf. Responded to treatment.

was punctured and the middle ear flushed, but we were unable to establish drainage through the eustachian tube. The temperature subsided and appetite returned, after which the animal appeared normal except for the position of the head and remained so until slaughtered, some eight weeks later, for food. At the time of slaughter the head was examined and a chronic, suppurative otitis media, complicated with chronic, suppurative mastoiditis of the right mastoid process was found. While this animal was not completely and permanently relieved, we believe fatal complications were aborted and the animal was permitted to feed out for the market.

Fig. 4. *History.* December 10, 1922 the owner noticed that the calf had difficulty in breathing and showed a nasal discharge. Two days later he noticed a discharge from the right ear. These symptoms became worse and the calf was brought to the hospital for treatment. Breathing was so labored that a trachea-tube was placed in the trachea. The auditory canal was cleansed and the tympanic membrane found to be ruptured, so that we could force antiseptic solution through into the pharynx and out through the nostrils. This treatment was repeated daily for a few days until the discharge ceased. The nasal cavities were also flushed daily. Animal sent home December 26th. On February 24, 1923 the owner reported the animal in good condition and no recurrence of any discharge.

The acute, suppurative type may occur secondary to the acute, non-suppurative type, or the infection may be primary, gaining entrance usually by way of the eustachian tube, but may in rare instances become infected through the external auditory canal and tympanic membrane.

Symptoms. It is usually ushered in with a loss of appetite and an elevation of the temperature, sometimes to 106 degrees F. The affected ear is drooped and if unilateral the head is tilted to one side with the affected ear down. The animal is depressed, dull and may walk or trot in a circle. Pain, sometimes quite acute, is manifested when pressure is placed about the base of the ear. If this condition is bilateral, the head is extended with the nose close to the ground; the animal may walk or trot in this position showing uncertainty of gait, dizziness, or may go in a circle in either direction. Sometimes they do not move, but lie around, markedly depressed and off feed.

Our experience with this type of the disease has been that unless treated at once, serious complications such as symptoms of generalized intoxication and pneumonia may present themselves, sometimes within 48 hours, death resulting shortly thereafter. Upon post-mortem examination of such complicated cases, lesions of septicemia and pneumonia, with metastatic abscesses in the lungs, may be observed. In addition, an acute, suppurative inflammation of the middle ear and eustachian tube may exist, as well as an acute or chronic rhinitis, the mucous membrane of the nasal cavity even being gangrenous in some cases. The tonsils may be badly inflamed and the crypts contain pus. The kidneys and mucous membrane of the bladder may show petechiae. The petrous portion of the temporal bone may be

slightly or quite noticeably movable and the mastoid cells may be somewhat involved.

III. THE CHRONIC SUPPURATIVE TYPE.

Fig. 5, a case of chronic, suppurative otitis media, shows left ear affected, with head slightly tilted and ear of affected side drooped. Chronic suppurative otitis media, without complications, shows about the same symptoms as the other types, except in a milder form, and tends to run a longer course. The animal may not show any loss of appetite and remain in good condition. Upon post mortem the middle ear is found to contain a purulent material, sometimes caseated, and the mucous membrane of the middle ear and eustachian tube thickened. Rhinitis and tonsilitis may or may not be present. This chronic type may become acute at any time, as shown by the record of the animal in Fig. 3.



Fig. 5. Chronic suppurative otitis media.

If the inflammation extends to adjacent structures, such as the mastoid cells, temporal bone or internal ear, we then have the chronic, suppurative type with complications. Fig. 6 illustrates a case of chronic, suppurative otitis media of the left ear with complications. Note the position of the head and the difference in attitude of the ears, as well as the poor general condition. (See also Fig. 2.)

The symptoms and pathological lesions in general are somewhat similar to those already described. However, the animal presents an unthrifty condition, and the cells of the mastoid process may be completely destroyed, converting the mastoid process into a cavity filled with pus. If the petrous portion of the

temporal bone is undermined and loosened, allowing the entrance of infection to the cranial cavity, symptoms of meningitis are then observed. Fig. 7 shows a dog with left ear affected, complicated with suppurative mastoiditis and meningitis as shown by post-mortem examination. If abscess formation occurs in this region, producing pressure upon the medulla, unilateral paralysis follows. In this case the animal goes down upon its side and apparently is unable to lie upon the opposite side. The infection may also pass through the internal ear, along the auditory nerve producing cerebellar abscess. Perhaps internal ear complications are responsible for some cases running in circles.



Fig. 6. Chronic suppurative otitis media with complications.

In addition to clinical observations, the Pathology Department has autopsy reports covering 11 cases which may be briefly summarized as follows:

Suppurative inflammation of middle ear and eustachian tube.....	15
Brain abscess:	
Cerebellar.....	1
Medullary.....	8
Purulent mastoiditis.....	3
Purulent tonsillitis.....	1
Lung abscesses.....	4
Pneumonia.....	2
Petechiae on the kidneys.....	2
Cloudy swelling of the kidneys.....	3
Cloudy swelling of the liver.....	2
Cloudy swelling of the heart.....	1
Discharge from the external ear.....	1

A case which had a history of running in circles one day and

found dead the next, upon post mortem showed a cerebritis and ventriculitis, the infection having gained entrance by way of the olfactory tract.

BACTERIOLOGY

A pure culture of a Gram-positive, short-chained streptococcus was obtained during an operation upon a pig affected with an attack of acute otitis media. This organism, in conjunction with staphylococci and *Ps. pyocyaneus*, has been found in several other cases examined.

TREATMENT

The treatment is most effective in the early stages of the disease, or at least while the inflammation is confined to the eustachian tube and middle ear. From my own experience with these cases I believe we can expect a permanent cure.



Fig. 7. Dog with suppurative mastoiditis and meningitis.

In the pig it is often difficult and probably impossible to decide definitely, from a physical examination, whether you are dealing with a simple otitis media, or one complicated with a mastoiditis, since you cannot palpate the mastoid process to any advantage. For the same reason, opening this process for drainage seems practically impossible in this species. I have been using the same treatment for these conditions in the pig and believe where the mastoid process is involved the condition may be so relieved as to permit the animal to be prepared for slaughter. (Fig. 3).

In the dog and cat the mastoid processes are accessible both for palpation and operation. This fact aids materially in differentiating between simple and complicated cases in these species. Fig. 8 shows chronic suppurative otitis media involving

the right ear, complicated with suppurative mastoiditis. This case is under treatment at present time. Since this picture was taken, Dr. Covault has punctured the tympanum and opened the mastoid process. When the infection has reached the cranial cavity treatment is of no avail.

The tubular portion of the external auditory canal of the pig begins at the inferior angle of union of the lateral and medial borders of the external ear and extends downward, inward and forward to the position of the tympanic membrane, a depth of 3 to 4 inches in the average pig weighing 100 to 200 pounds. The middle ear is a relatively small cavity, lined with mucous membrane, which is a continuation of the mucous membrane lining the eustachian tube. The tympanic cavity (or middle ear) contains the ossicles and communicates with the pharynx through the eustachian tube. Fig. 9 is a schematic drawing of a section of a pig's head, showing the relation of the external auditory canal (A); the tympanic membrane (B); and the eustachian tube (C).



Fig. 8. Chronic suppurative otitis media, involving the right ear, complicated with suppurative mastoiditis.

The object to be obtained in treating this condition consists of overcoming the inflammation of the middle ear and eustachian tube, and thereby reestablishing free communication between the pharynx and middle ear. It is also very important to relieve nasal and postnasal inflammatory processes. By puncturing the tympanic membrane the middle ear is thereby relieved of pressure and may be partially cleansed with warm antiseptic solution. For puncturing the tympanic membrane, a slender flexible in-

strument, about six inches in length, has been found to be most suitable. Since at the present time such an instrument is not to be found on the market we are using a hack saw blade. I find the saw teeth to be a great advantage in that they make secure a film of cotton used in drying and cleansing the auditory canal and middle ear, and also in anaesthetizing the tympanum. I therefore prefer having at least two saw-blades prepared for the operation.

The external auditory canal is thoroughly cleansed and dried. I sometimes apply phenol, 10% in glycerin, for several hours before operating in order to prepare the field thoroughly. An instrument carrying a film of cotton, saturated with a few drops of anaesthetic, is advanced to the tympanic membrane and left in position for about five minutes. The anaesthetic used consists of the following formula: Equal parts of cocain crystals, menthol crystals and phenol crystals, mixed together and allowed to stand a few minutes until a syrupy solution is formed. The

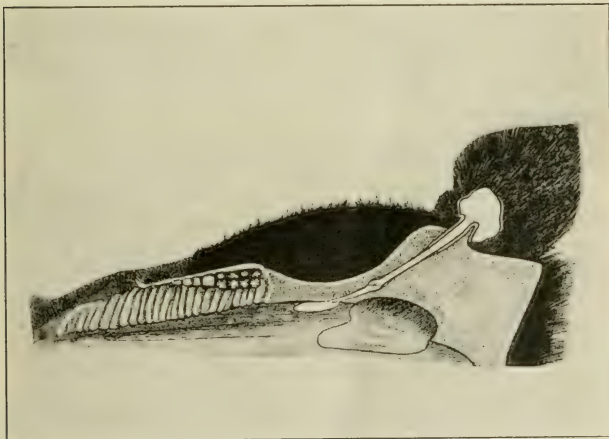


Fig. 9. Schematic drawing of a section of the pig's head, showing relation of external auditory canal (A), tympanic membrane (B) and eustachian tube (C).

plain instrument is now advanced to the tympanum, which offers a certain characteristic resistance. By applying slight pressure you overcome this resistance, the instrument enters the middle ear, and then meets firm resistance by striking the medial wall.

Before cleansing the middle ear cavity with antiseptic, the head and particularly the nostrils are lowered so as to supply better drainage and avoid complications.

A two-ounce dose-syringe, with slender nozzle, is very convenient for injecting solutions into the ear. Sometimes repeated injections are necessary before the solution passes out through the nostrils, unless considerable pressure is used. Pressure is avoided in human surgery because of the danger of spreading the infection into the mastoid cells. I find I get best results by using Bipp and, if necessary, applying a little pressure. Bipp, as recommended by Rutherford Morison in his Bipp treatment of war wounds, consists of the following ingredients:

Iodoform.....2 ounces

Bismuth subnitrate.....1 ounce

Liquid paraffin.....1 liquid ounce

The amount of the liquid paraffin varies according to the consistency desired, that is, liquid or paste. For use in these cases we use sufficient stanolax to produce a liquid of proper consistency for use in a syringe.

Very few treatments seem to be necessary especially in the early stages of this condition. When free drainage is established through the eustachian tube, I believe treatment can be safely discontinued.

NEW BIOLOGICAL LABORATORY

Announcement has been made of the incorporation, under the laws of Ohio, of the Columbus Serum Company, with a capitalization of \$50,000. The address of the new concern is: 2025 S. High St., Columbus, Ohio. Buildings were started January 15th, and will be completed April, 1923, at which time the production of hog cholera virus and anti-hog cholera serum will be started. A production schedule for this year calls for five to eight million cubic centimeters. The new Company will operate under a U. S. Veterinary License and sell to veterinarians only. They will also engage in the distribution of a full line of general supplies for veterinarians.

The officers of the Company are: President—Mr. E. C. Irvine; Vice-President—Dr. F. A. Lambert; Secretary-Treasurer—Dr. P. C. Hurley. Production will be under the direction of Dr. Hurley, while the business management and sales will be handled by Dr. Lambert, both of whom are widely known and experienced in their respective capacities.

TRAUMATISM OF THE ABDOMINAL AND THORACIC CAVITIES¹

By DR. R. M. PHELAN, *Sharon, Pa.*

In presenting this paper it is not my intention to tell of any new discovery or treatment of this very aggravating disease of cattle, but to recount some of my own experiences extending over a period of twenty-eight years of active practice, in order to bring out an animated discussion of its relief when relief is possible, and also to try to arrive at an early diagnosis of the existing condition. Traumatisms of the abdominal and thoracic cavities may be divided into two classes: (1) traumatism of accident from external causes and (2) traumatism from swallowing hard or metallic substances.

We will first discuss the causes of traumatism from external violence as I have seen them. The most common one is caused by the sharp horns of some other member of the herd penetrating between the ribs or perforating the abdominal walls. Also we have as an external cause perforations from sharp sticks, the extension on the ordinary farm gate, the stepping on one end of a pointed rail or post, causing the animal to tilt the object on end and the movement of the cow forward will cause the object to penetrate the abdominal wall, with the well-known resulting hernia of omentum or viscera. Then we have those caused by kicks from horses, and lastly one case that came to me having been caused by the long tusks of a vicious boar hog.

Next we have those cases so familiar to the veterinarian of experience, caused by swallowing of foreign substances: nails, screws, fence-wire, forks, glass, in one instance a three-and-a-half-inch gear-wheel, plugging the outlet to the stomach, in another a twenty-six-inch umbrella steel in its original shape, large darning needle, an ordinary bag needle and in fact any object that it is possible to get down the oesophagus the cow will swallow.

Now we come to what is in my opinion the most important consideration of these cases, namely, the diagnosis with its accompanying prognosis, for I know of no class of disease that can make or break the average veterinarian like these cases. His ability to make a correct diagnosis will cause his client to say, "Why that man can see right through a cow." And if he

¹Presented at the fortieth annual meeting of the Pennsylvania State Veterinary Medical Association, held at Harrisburg, Pa., January 23 and 24, 1923.

fails to make a correct diagnosis he will hear that his client has told his neighbor that, "That damn fool couldn't doctor a cat."

The symptoms in the early stage of this trouble are very apt to be misleading, the animal showing the ordinary symptoms of indigestion. In a very short time we have the familiar grunt, the head carried low, the fever, the tendency to want to lie down with the neck extended, with the under jaw flat on the floor, and a tendency to extend the tongue from the mouth, similar to a cow just freshened. As the disease progresses the elbows are turned out from the sides, the eyes recede in their sockets, and in those cases where the object has punctured the diaphragm and pericardium, the presence of traumatism can be definitely diagnosed by the "slopping" sound of the heart, as it beats laboriously in the pus-filled pericardium. As the disease progresses to a still nearer fatal termination you have a dropsical swelling, starting in the lower cervical region of the brisket, and extending backward, of a profuse, boggy nature, often five to six inches deep and extending clear back to the abdomen.

The prognosis and treatment of these cases are, as a rule, not satisfactory, for the very good reason that when the cow was at that stage of her trouble where skillful treatment would have saved her life, her owner has given her a dose of Epsom salts, thinking she had indigestion, and by the time the veterinarian is called the perforation and pus formation have taken place, and treatment and prognosis are decidedly unfavorable. When, by the ordinary symptoms, we are reasonably sure of our diagnosis of stomach traumatism, our only recourse is rumenotomy. If this is performed early, the patient will recover in nearly all cases; if neglected or postponed for a day or two, and ingesta have escaped into the abdominal cavity, or an abscess has formed at the point of puncture, your prognosis is one of fatality.

However, with the knowledge and consent of the owner, rumenotomy should always be attempted in those cases which show no evidence of pus. If allowed to go on, they will invariably die, and this operation might save her. Rumenotomy in those cases where dropsical swellings have developed should not be attempted; the disease has passed the stage where treatment would do any good. As regards individual cases that have come up in my own experience, I might note that of the umbrella steel, that of the gear-wheel, that of a hay-hook, inserted with malicious intent, deeply into the vaginal wall, that of a chestnut limb found imbedded between the udder and abdominal wall

and entirely healed over for a month, but finally suppurating out of its bed, that of a stake between the scapula and ribs, and lastly the traumatism caused by an excited foreign woman, whose cow becoming suddenly tympanitic, she attempted paracentesis with the butcher knife, and as the knife descended in her muscular grasp, the cow ascended in a wild leap, with the result that stomach movements took place through an entirely new channel.

VACCINATION AGAINST BOVINE INFECTIOUS ABORTION¹

Many of the best veterinary bacteriologists have been working for years on the subject of vaccination as a means of controlling abortion. Thus far their efforts have had no practical value in the solution of this perplexing problem.

Most of our best authorities believe that a high percentage of abortions in cattle are due to the Bang bacillus. The use of dead Bang bacilli as a prevention for abortion has been found practically worthless. The use of a suspension of the virulent organisms would be a dangerous means of producing bovine infectious abortion in a herd that is free from the disease. Its value in infected herds has yet to be demonstrated.

It is illegal in Pennsylvania for anyone to use vaccines which contain the living organisms of disease without first having obtained a permit to do so from the Bureau of Animal Industry. Certain other states have similar laws.

Live stock sanitary officials are conducting experimental tests on a few carefully selected herds. Until it has been authentically proven that a safe and efficient plan has been developed, the work of vaccination against bovine infectious abortion should not be attempted or recommended by the private practitioner.

C. J. MARSHALL.

Considerably over one-third of the automobile emblems we have sold so far this year have been purchased by California veterinarians. We hope that this is an indication of prosperity among our brothers in the Golden State. The climate, of course, has nothing to do with it.

¹From the University of Pennsylvania Bulletin, Veterinary Extension Quarterly, Number 9.

CONCERNING STERILITY

By S. Sisson, *Ohio State University, Columbus, O.*

May I suggest that the Editor and the Executive Board might perhaps have availed themselves of the authorization contained in Section 7.K. of the Constitution of the American Veterinary Medical Association "to withhold from the Journal, in whole or in part, any paper or part of proceedings, etc."?

The reference here is to part of the Proceedings of the St. Louis meeting of the A.V.M.A., printed in the February number of the Journal, on page 658 *et seq.* Special attention is called to the colossal conceit involved in parts of the first paragraph of the address on sterility—if we take it seriously; perhaps it was intended to be humorous. If the latter, it may be dismissed as being merely in bad taste in the discussion of a serious and difficult problem before a professional audience.

The writer is not a pathologist or a clinician, and therefore leaves to his colleagues in those branches the duty of attending to the vagaries of some sterility propagandists with which we have been deluged for some time past. On the other hand, he feels somewhat at home in discussing matters which involve anatomical data. In this connection attention is invited to the following statement on page 659:

"A man, if he is adept at all, can become so proficient in the work that up to about three months he can tell within three or four days how long the animal has been bred; in other words, you can tell a six weeks' pregnant animal or you can tell a six and a half weeks' pregnant animal."

The speaker was perhaps not aware of the fact that in the case of two domestic animals only, the pig and the chicken, have the average lengths of embryos at various ages been determined by competent embryologists with any such accuracy as is implied in the claim made above. There are no "Norm-Tables" of bovine embryos, and the amount of reliable information on the subject is unfortunately negligible. This circumstance may seem strange to anyone not familiar with the methods used in such investigations. The fact is that no veterinary anatomist, in this country at least, has ever had the necessary time, facilities, or material for such an extensive research. How long is an average bovine embryo of six weeks? What are the limits of variation in size of embryos of this age or any other age? What is the usual increase in size of such an embryo in three or four days? Have the beef breeds of cattle a more "flabby" uterus than the Guernsey

or Jersey? Can the normal uterine (or Fallopian) tube of the cow be palpated with any certainty, or in fact at all, *per rectum*?

A little further on the speaker said:

"There doesn't seem to have been much said relative to the arteries that supply the uterus with blood. Without the examination or without the knowledge of the postero vaginal artery, its size and its beat, I would be nonplussed many a time."

Why did not the speaker enlighten us concerning this "postero-vaginal" artery? It is entirely unknown to anatomists, who are familiar only with anterior, middle and posterior uterine arteries. Is it behind the vagina, as the new name would indicate, or was the reference to the middle uterine artery, which naturally is the one used by properly-informed clinicians to determine the evolution of the gravid uterus?

In cautioning practitioners that in examining the uterus *per rectum* they were not trying to reach the liver, he added:

"You are not in any further than your wrist."

His hand must be exceptionally long.

Some interesting statements were made during the discussion by another specialist. One of these was:

"The ovaries of the cow can be very readily palpated."

This statement will be readily agreed to, in so far as it applies to those who have had the necessary training in anatomy and physical diagnosis and some clinical experience, but the speaker must be aware of the fact that most of his hearers who were not recent graduates of the better schools have not had adequate training in college in this respect. Why did he not give them some accurate information concerning the most usual position of the ovary and the more common variations therefrom; its average distance from the anus in cows of medium size; what landmarks could be used to locate it, etc.?

Further on, the speaker distinctly gave the impression that a large *corpus luteum* causes pressure-atrophy of the ovarian tissue. Is there any evidence of this? The statement that

"We have the false and the true *corpus luteum*, and we have them forming every time that ovulation takes place."

is decidedly ambiguous. But there is no ambiguity about the sentence:

"But in case of fertilization it starts to grow and grows to a size of an ear of corn."

The writer has observed a good many *corpora lutea* and is quite familiar with corn, but never thought of making this comparison. However, it was perhaps merely a *lapsus linguae*, but would seem to connote also a lapse from the accuracy of thought and expres-

sion which a professional audience rightfully expects from an expert.

The term "suppression of the *corpus luteum*" is incorrect and should not be permitted to secure a standing by usage; the proper word is "expression." This is not merely a personal opinion; reference to standard medical dictionaries will validate it.

The statement that

"The vagina is lined with stratified squamous epithelium, and this heavy epithelium protects the organ against infection."

is in part, at least, incorrect. In the chief domestic animals the vagina is lined with transitional epithelium, a type which is not thought to confer any great immunity. It is only about three or four cells thick and the superficial layer cannot be classed as squamous; some of these cells are flattened a good deal, but the majority are distinctly columnar. The differences in this respect seem to be temporary and due to the varying amount of secretion in the cells. It is to be hoped that the use of the word "heavy" in such a connection will not become at all general.

Several statements of an anatomical nature concerning the *cervix uteri* require notice. It was said to be "made up of fibrous tissue." The fact is, of course, that its chief constituent is unstriped muscle. The amount of fibrous tissue in its wall is relatively quite small in the normal condition. Of course, fibrosis can occur here as anywhere else. It might, in fact, be confidently expected to result from some procedures which have been recommended to the practitioner by some members of the profession whose knowledge and judgment are apparently not in conformity with their energy and enthusiasm.

The writer is unable to understand this sentence:

"It (the cervix) is composed of about three annular rings and has longitudinal layers of mucous membrane, and these crypts or folds are rather deep."

No great fault can be found with the statement that:

"The body of the uterus is rather short."

The speaker was conservative in so expressing the fact that the length is about an inch and a half. He omitted to state that this fact cannot be determined by palpation.

In the next paragraph we are informed that

"the *corpus luteum* invariably is slightly elevated,"

and almost in the same breath we are told that in some cases

"there is no elevation at all, and the only difference is that this ovary is larger than the other."

The writer admits freely that this is too much for the "old bean", and suggests rather feebly that the speaker might have added to the confusion of his hearers by informing them that in a decided

majority of cases the right ovary was larger than the left one.

Mention was made of the prostate "glands" (of the bull) as being "rather lobulated", and it was said that they

"can be enlarged rather rapidly and rather easily palpated."

The prostate is regarded by anatomists as a single, not a double structure. In the bull almost all of it is practically a part of the wall of the urethra. The only exposed part of it consists of a transverse band, half an inch or less in thickness, which lies upon the anterior end of the urethra and is partly under cover of the *vesiculae seminales* and *ductus deferentes*. It seems decidedly doubtful whether it can be palpated *per rectum* with any definiteness unless considerably enlarged. The literature does not appear to contain an account of any authentic cases of prostatic hypertrophy in the bull. In this connection it may be related that a few years ago a veterinary pathologist demonstrated to his class a supposed case of prostatic hypertrophy in a large boar (which has a prostate similar to that of the bull); the so-called "greatly enlarged prostates" were normal bulbo-urethral (or Cowper's) glands. The prostate had not been exposed to view at all, and appeared to be quite normal.

There seems to be a need for good terms to distinguish between a *corpus luteum* associated with pregnancy and one which is not. The adjectives "true" and "false" are much used, but cannot be regarded as satisfactory. The terms used by the speaker quoted above, "retained *corpus luteum*" and "*corpus luteum* of pregnancy" would seem to be a decided improvement. So far as the writer is aware, we have few if any reliable data as to the persistence of the *corpus luteum* and its usual reduction during pregnancy. It should be noted in this connection that the fibrous stage (*corpus fibrosum*) in the involution of a *corpus luteum* cannot always be distinguished from the similar stage of the atretic (Graafian) follicle. There appears to be a good deal of misapprehension concerning the recognition of *corpora lutea*, even on inspection of the ovary after removal of the latter. The writer recently examined and sectioned a number of ovaries which had been used by an expert on sterility in an address and demonstration before a large state association. One of the ovaries showed what appeared on very cursory superficial examination to be a typical *corpus luteum* and it was so designated by the speaker. The prominence was 1.5 cm. in diameter and projected 0.5 cm. from the adjacent surface of the ovary, from which it was clearly defined by a neck. On section it was quite evidently

ovarian tissue with the exception of a strip only 2 mm. wide along a small part of the edge, which was quite as clearly *corpus luteum*. The bulk of the latter occupied the central part of the ovary; it was 1.8 cm. long and 1.2 wide on section and most of it was covered by a layer of ovarian tissue 0.5 cm. thick. Of course a careful and well-informed observer would not make the mistake of demonstrating a prominence such as this as a *corpus luteum*. But this is not the first time that the writer has observed this error on the part of sterility experts. Such an arrangement of the ovarian tissue, with a large central *corpus luteum* almost entirely extruded from the surface of the gland, is not rare. But it seems to have escaped the attention of at least some of the experts. More than once the writer has been amused by watching an expert attempt to express such a prominence before a veterinary audience. How can such a prominence be distinguished *per rectum* from a *corpus luteum*? The writer admits freely that he is unable to make the distinction by the sense of touch alone.

Criticisms such as those made above are not pleasant to make, nor are they merely destructive. A professional man who, as an expert, speaks before or writes for his colleagues cannot evade his responsibility for accuracy by saying (usually afterward) that he is not an expert on anatomy, pathology, etc. He is naturally and properly expected to have used due care in verifying *all* of his data. Neglect of this precaution is reprehensible, for the evident reason that members of the profession—especially the younger ones—may easily be misled and caused to adopt ideas which are more or less seriously erroneous. And, more serious still, they are likely to lead to clinical procedure which brings results that are embarrassing or disastrous as the case may be.

The campaign against sterility is one of the most important movements ever initiated by our profession, and is fraught with corresponding possibilities for good or ill, both to the live stock owners and the veterinary profession. Therefore we, as a profession, cannot take it too seriously. At present our methods in this regard seem to be more largely empirical than one could wish. As in all such problems we are dependent for success on careful investigations by well-trained and able men of the fundamental underlying facts, upon which our clinical and hygienic procedure must be based. Zeal without knowledge is still vain.

RABIES VACCINE CANINE. SINGLE DOSE TREATMENT¹

By JOHN REICHEL and J. E. SCHNEIDER

Glenolden, Pa.

The purpose of this experiment (No. 127) was to determine whether or not a "dead" or non-infective vaccine was equal to a "live" or infective vaccine, as an immunizing agent in the single-dose treatment.

Thirty-five dogs, ranging from 6 to 34 lbs. in weight were injected subcutaneously on June 23, 1922 as follows:-

TABLE 1

Dogs	Lot	Amount Injected Subcutaneously
5	(A) Live vaccine 1 day old	5 cc
5	(B) Dead vaccine 1 month old	"
5	(C) Dead vaccine 9 months old	"
20	(D) Dead vaccine 1 month old	"

By September 23, 1922, twenty dogs were alive and apparently normal. Fifteen of the thirty-five originally injected died of various causes and minor derangements. When the cause of death was not determined, two rabbits were injected subdurally with the brain emulsion, and held long enough to prove that rabies was not present.

On September 23, 1922, the twenty remaining dogs, and nine previously untreated dogs for controls, were injected intraocularly with 0.1 cc of the "street virus." (The history of the "street virus" is as follows: From dog to man, 6-8-22; to rabbit No. 361, 7-3-22; to rabbit No. 650, 7-24-22; to dog No. 6, 8-22-22; dog died of rabies 9-18-22. The brain of dog No. 6 was used as the "street virus.")

TABLE 2

Dogs	Lot	Amount Injected Intraocularly	Alive 1-23-23	Dead of Rabies
3	(A)	0.1 cc	2	1
2	(B)	"	0	
5	(C)	"	3	
10	(D)	"	2	
9	Controls	"	0	9

Although twelve of the previously treated dogs died after receiving the injection of "street virus," only one of these died of

¹Presented at the fortieth annual meeting of the Pennsylvania State Veterinary [Medical Association at Harrisburg, Pa., January 23 and 24, 1923.

rabies. The other eleven died from other causes all proven not to be rabies. Moreover, all nine control dogs died with clinical rabies, eight cases of which were established by animal inoculation.

SUMMARY

1. "Dead" rabies vaccine, in the single-dose treatment used, can be said to have immunized and protected, since (1) five out of the twenty treated dogs remained alive for more than 100 days after the injection of "street virus"; (2) only one out of the twenty treated dogs developed rabies after the injection of "street virus"; (3) all nine untreated dogs developed rabies after the injection of "street virus."

2. To avoid a high percentage of accidental deaths in an experiment of this sort, the dogs should be kept in individual cages, properly housed and carefully rationed.

3. A clinical diagnosis of rabies must be supported by the results of the subdural injection of two rabbits with the brain emulsion of each dog.

VETERINARIANS AS LEGISLATORS

Dr. Harris B. McDowell, of Middletown, Delaware, is Senator from the 7th district (New Castle County), in the Delaware Legislature.

Dr. W. A. Haines, of Bristol, Pa., who is a member of the Pennsylvania State Legislature, has been made Chairman of the Agricultural Committee and a member of the Appropriation Committee.

Dr. A. S. Cooley, of Cleveland, Ohio, is again a member of the General Assembly of Ohio, as Republican representative from Cuyahoga County. Dr. Cooley is a former President of the Ohio State Veterinary Medical Association, and has long been a very active member of the American Veterinary Medical Association. A letter just received from Dr. Cooley states that he is very busy with legislation having to do with a gasoline tax, road matters, blue-sky laws, old-age pensions, chiropractors and minimum-wage questions.

The odor of iodoform may be removed from a mortar by washing first with a caustic soda solution, then rinsing with a little denatured alcohol.

STUDIES ON INFECTIOUS ENTERITIS OF POULTRY CAUSED BY BACTERIUM COLI COMMUNIS

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A disease affecting chickens, turkeys and ducks, which the writers have characterized Infectious Enteritis, came to the attention of one of us about two years ago, but it did not receive serious attention until the past year, when it assumed epizootic proportions, infecting a large per cent of the poultry flocks in Northern and Central Delaware. This outbreak seemed to start during the Spring months of 1922, in the extreme Northern end of the State. At least, the first birds coming into the laboratory for diagnosis came from this section and the disease gradually spread southward. In the Fall, it was found in the central part of the State. It is impossible to estimate the total number of birds infected, as many owners failed to report the disease. Efforts to check the outbreaks were at first unsuccessful and during this time the mortalities ran at a high rate and many flocks suffered heavy losses. The epizootic greatly decreased with the advent of freezing weather, although some new outbreaks and recurrences on farms where the disease previously existed are coming to our attention.

HISTORICAL

Other workers have reported the presence of *Bacterium coli*-like organisms in diseases, some of which closely resemble the Delaware outbreak. The first report of this kind that we are able to find was made by Lignieres¹ (1894). He states that a virulent type of the colon bacillus had caused the death of many fowls on a poultry farm. The fatal cases showed the following lesions:

The comb was somewhat darkened, but not nearly so much as is usually found in cases of fowl cholera. There were evidences of diarrhea. The blood was found clotted in the ventricles. The lungs, liver and kidneys were normal in appearance. The spleen was slightly enlarged and soft. The intestines were congested and hemorrhagic in places. There was a small quantity of serous exudate in the abdominal cavity. He isolated, in pure culture, from the blood, liver and spleen, a small, motile, Gram-negative bacillus, with rounded ends. The organism was twice as long as wide. The cultural and biochemical reactions of the organism in carbohydrate broth, milk, gelatin, agar, and peptone broth were similar to the colon bacillus.

Klein^{2,3} (1889), described under the name "Grouse Disease," an infectious disease of grouse (*Lagopus scoticus*), caused by a microbe of the *Bacterium coli* group, and characterized by congestion of the lungs, necrotic areas in the liver, and patchy redness of the intestines. There was marked emaciation of the carcass. The heart was filled with coagulated blood. Bacteriological studies resulted in the isolation, cultivation and successful inoculation of a pleomorphic micro-organism which, according to Klein's description and further studies by Dr. Theobald Smith,* proved to be a variety of *Bacterium coli*.

*Mentioned by Dawson.

Francesco Sanfelice⁴ (1895), described an epizootic of pigeons which was caused by *Bacterium coli*. Examination of dead birds revealed a sero-fibrinous exudate in the peritoneal cavity, an abnormal amount of abdominal fluid, enlargement of the spleen and adhesions of the intestine to the heart and liver. The exudate appeared to form a false membrane, which would hold together if grasped and lifted with forceps. The oviduct in some pigeons was also inflamed and covered with a purulent exudate.

Cultures in gelatin and agar and smears on slides were made of the peritoneal exudate, organs and heart-blood. Pure cultures of *Bacterium coli* were obtained, and smears stained with carbol-fuchsin exhibited short, plump, round-ended bacilli. Sometimes preparations of the heart-blood showed bipolar organisms resembling *Bacterium avisepticum*.

Fiorentini⁵ (1896) isolated from cases of hemorrhagic septicemia in swans, an organism showing polar staining, but differing from the bacillus of fowl cholera. He states that it grew like *Bacterium coli communis* on solid culture media, but does not record the action of the organisms upon carbohydrate media. His drawings and description, however, lead one to think that probably he was dealing with a virulent colon bacillus.

Martel⁶ (1897) reported finding a virulent colon bacillus infecting hens and turkeys. He reports that hens, killed on the sixth day of their sickness, presented emaciation, evidences of diarrhea, somnolence and conjunctivitis. On autopsy he found pericarditis, with an abundant false membrane*, without much liquid, congestion and friability of the spleen, inflammation of the small intestine and the caeca and suppurative conjunctivitis of the right eye. From the blood, liver, false pericardial membrane and the conjunctivitis exudate, he isolated a bacillus, and upon studying it culturally and biochemically, it proved to be a colon bacillus. The turkeys which died of the same malady, showed symptoms and lesions similar to the hens, but the organism he found in the turkeys was not so virulent as the one obtained from the hens.

Dawson⁷ (1898) investigated a poultry disease outbreak in the vicinity of Washington, which corresponds in symptomatology and pathology, to the Delaware outbreak. Dawson, however, did not recognize the causative organism to be *Bacterium coli*, but called it *Bacterium astheniae* and named the disease "going light," or infectious asthenia. He states that the most noticeable condition of the sick birds was their extreme emaciation. Other symptoms were: voracious appetite, and comb and wattles slightly paler than is usually found to be the case. There was no diarrhea or increase in body temperature. The disease was a chronic one, lasting about three months before a fatal issue. In the flock were 350 fowls, of which 30 had died and 100 were sick. As the disease made itself known only through loss of flesh, the poultry owner and his neighbors called it "going light." Post-mortem examination revealed an extreme emaciation of the muscular tissue. The duodenum was the only organ noticeably affected. The walls of this structure were highly inflamed and the contents were mucoid in appearance. From the duodenal contents of infected chickens, Dawson isolated, in pure culture, a colon-like organism which would produce acid and gas in lactose, dextrose, and sucrose broth. The organism was non-spore-forming, one to one and one-third microns long and nearly one-half micron wide, often occurring in pairs. It was Gram-negative, did not liquify gelatin, but coagulated milk with the production of acid.

Mazza⁸ (1899) observed an outbreak of a disease among hens that was probably caused by *Bacterium coli*, although from his meagre description of the organism, one could not be certain of the identity. The disease was characterized by hemorrhagic enteritis.

Joest⁹ (1902) reports finding in three epizootic appearances of dead hens in transport, an organism isolated from the heart blood, spleen, liver and intestinal contents which he called *Bacterium intestinale gallinarum*. In the course of his experiments, he found *Bacterium coli*, as well as the previously named organism.

About 1906, there was a highly contagious and rapidly fatal disease prevailing among quail in this country. Morse¹⁰ received at his laboratory, large

*The writers have encountered this lesion in a number of instances.

numbers of dead or dying quail from various parts of the United States. The symptoms were usually manifested by dullness and a tendency to sit in the corner of the cage with feathers ruffled. The food was neglected and, generally in two or three days, before diarrhea had developed or emaciation made its appearance, the bird was dead. Sometimes the disease ran a more chronic course and though diarrhea was rarely very marked, emaciation became extreme. The post-mortem examination revealed the following: "Lungs slightly congested; liver congested and presenting a few small areas of superficial necrosis; intestines studded with minute ulcers; spleen always congested, sometimes enlarged, sometimes quite dark." The constant feature, however, was the intestinal lesions. These were generally recognized by the necrotic areas, although sometimes large areas of inflammation were observed. Cultures made from the blood, lungs, liver and intestines gave rise to a rather actively motile, Gram-negative, rod-shaped organism, appearing often as paired ovals, single or paired rods with rounded ends, and even filaments. Polar staining was quite constant, and no spores were ever detected. It was a facultative anaerobe. Its growth on gelatin, the character of gas formation in carbohydrate broth, and its milk-coagulating properties prove it to be a form of *Bacterium coli*. The bacillus could not always be isolated from the heart-blood or from the lungs. It could usually be cultivated from the liver in which lesions existed and always from the infected intestines.

Claussen¹¹ (1907) added to the knowledge of colon septicemia by his investigations which he undertook with hens dying during shipment. Claussen found, in the blood of the dead hens, the colon bacillus in pure culture. Other bacteria were not present. The sick birds showed cholera-like symptoms. They sat around dull and drowsy, with a mucous discharge from the closed eyes. They would refuse to eat. Diarrhea was noticed in some of the birds. There was one cock which was especially severely infected. His heavy comb hung down to one side, was partly dark-colored and felt cold to the touch. Some of the sick fowls would recover after three or four days. Upon dissection, the heart was found to be filled with black, partially-clotted blood and the epicardium was covered with small petechiae. The intestinal mucosa appeared slightly inflamed, and the parenchyma of the liver was slightly darkened. A blood-smear of the heart, stained with carbol-fuchsin, exhibited under the microscope, a microorganism very similar to *Pasteurella cholerae-gallinarum*. One could observe countless organisms, some oval and others spherical, which appeared like bipolar-stained bacteria, lying between or beside the erythrocytes. However, these organisms appeared about twice the size of fowl cholera bacteria. Claussen found the mortality among naturally infected hens to be about fifty percent. He concludes from his results that "*Bacterium coli* may, under certain conditions, take on the ability to leave the intestines, become virulent, and cause a septicemia in hens, especially if their resistance has been weakened by hunger, thirst, cold, or lack of good ventilation."

Among several organisms isolated by Hadley¹² (1910) from cholera-like outbreaks of disease in Rhode Island, was a colon organism. This was isolated from the spleen of a bird which had been sick for three or four days before death. The earlier deaths in the flock had been more sudden and without apparent cause. The birds manifested a high temperature and a yellowish diarrhea was present. Upon examination the liver was hyperemic and soft, and the spleen was enlarged. The entire intestinal tract showed severe inflammation. The intestinal contents were blood-stained, indicating a hemorrhagic condition. The liver and heart blood also yielded, in pure culture, an organism which culturally and biochemically corresponded to *Bacterium coli*.

Two cases of colon septicemia in hens were reported by Zeiss¹³ (1914). Post-mortem examination revealed no pathological changes outside of a striking softness of the spleen and the liver and a few small subcutaneous hemorrhages. Stained preparations from the internal organs and blood exhibited a mass of oval and elliptical polar-stained rods. An organism was isolated in pure culture which in all respects corresponded with *Bacterium coli communis*. The organism was very pathogenic for canary birds, but he was unable to infect guinea pigs, either subcutaneously or intraperitoneally.

Baudet¹⁴ (1922) isolated from the carcass of a hen, a bacterium which at

first appeared to be a paratyphoid. On further bacteriological studies, however, it proved to be a colon bacillus. This particular strain, however, appeared to be of importance for the reason of its high virulence. A subcutaneous injection of a loopful of the culture killed mice and pigeons in two days. Chickens also proved very susceptible, an intramuscular injection killing them in a few days. The chickens which were used for experimental purposes revealed hemorrhagic enteritis, which markedly simulated the lesions found in the original bird. The same owner lost a considerable number of chickens from the same disease.

SYMPTOMATOLOGY OF THE DELAWARE OUTBREAK

The symptoms of infectious enteritis vary to a considerable extent in different flocks, but to a less degree in individuals of the same flock. This variation is explained by differences in the virulence of the invading microorganism, the general health and sanitary conditions surrounding the flock, and the presence or absence of a secondary disease or secondary invading organism. Typical outbreaks may be considered as presenting acute and chronic forms and rarely a peracute form may be encountered.

The acute form, in which the birds live for several days, may be regarded as the most usual form of the disease, although in such outbreaks some of the acute cases become chronic and may survive for weeks. Often the first symptom noted by the owner in the acute cases is the general or partial paralysis. This paralytic condition resembles the so-called "paralysis" described by Gage¹⁵, which is so prevalent among the poultry of Massachusetts. Some of these cases resemble botulism and a careful study is necessary in order to differentiate between the two diseases. The paralysis may affect the muscles of locomotion to such an extent that the bird is unable to walk or move about. Other than the paralysis, the bird presents few symptoms during the early stages of the disease.

The appetite usually remains normal, the comb possesses a normal, red color, and the droppings are normal in color and consistency. After a few days, the bird may develop a diarrhea, assume a drowsy or sleepy attitude, and some owners report that the affected birds apparently become blind. Few of the cases showing general paralysis recover, death usually occurring in about one week. Cases showing partial paralysis of one leg, or one wing, or dropping of the tail feathers, are not uncommon. These cases usually assume a less acute form and are accompanied by pronounced emaciation, terminating fatally in about two weeks. Both types of the paralysis herein described may be encountered in the same flock.

The chronic form of the disease is characterized chiefly by

marked emaciation, that is, "going light." It may or may not be accompanied by the paralytic symptoms. We have encountered several outbreaks showing typical, post-mortem lesions and yielding *Bacterium coli communis*, in which the only symptom was the "going light." In such flocks, the mortality was low. In outbreaks accompanied by a high mortality, the paralytic symptoms invariably predominated and the disease assumed the acute form. In several outbreaks we encountered a peracute form of the disease. In these outbreaks, the birds died suddenly, without warning, often being found dead under the roosts or upon the nests. This form of the disease resembles fowl cholera in its symptomatology. In some outbreaks we have encountered the peracute, acute and chronic forms co-existent. The disease was encountered chiefly in chickens, although several extensive outbreaks were studied in young turkeys and in a number of instances ducks were found infected. Guinea fowls raised very extensively on Northern Delaware farms apparently remained free from infection.

PATHOLOGY

The pathology shows as much, if not more, variation as the symptomatology. The variations encountered led to considerable confusion in our early studies, but after examining a great many birds, all having the disease, we have come to the conclusion that in the acute, uncomplicated cases, the post-mortem lesions are very meagre. In the peracute form and in the early stages of the acute form, no macroscopic lesions may be observed upon post-mortem examination. Acute cases that have died, or been killed shortly before examination, invariably present localized inflammatory areas of the intestinal mucosa. These areas may be very small in size and are usually found in the duodenum, near the ileo-caecal openings and in the rectum. Such cases seldom show a congestion of the mesenteric or intestinal-wall blood-vessels, and all other organs remain normal. Birds that have been sick for some time frequently show extensive lesions of enteritis. In such cases the liver and spleen may be enlarged and hemorrhagic and the heart may show a few petechiae. Cases of the subacute and chronic types, while varying considerably, invariably show marked emaciation of the entire musculature ("going light"), absence of fat in the abdominal viscera, and enteritis in varying degrees.

Other diseases, as fowl typhoid and cholera, may exist in the

flock at the same time, and thus serve to complicate the pathological and bacteriological findings. If either one of these diseases exists in the flock, it will predominate in the post-mortem picture and bacteriological findings. In a number of outbreaks investigated by the writers, we believe that a complication of diseases existed, the most frequent of which was fowl typhoid.

BACTERIOLOGY

The bacteriology of infectious enteritis is also confusing, as it is not possible to demonstrate, always, the presence of a micro-organism in the blood, or in cultures taken from the blood, liver, spleen, or intestinal wall. Cases showing none, or very slight, lesions may give negative bacteriological findings. In cases showing only slight lesions of enteritis, cultures from the blood, liver and spleen invariably remain sterile, although deep, mucous-membrane cultures frequently yield pure cultures of *Bacterium coli communis*. In cases showing extensive enteritis, we have isolated the organism in pure culture from the blood and from the liver.

Reproducing the disease with the organisms isolated has proven successful in some instances, although the results obtained by different workers show considerable variation. Lignieres¹ reports that experimental subcutaneous and intramuscular inoculations of two-cc doses were fatal for pigeons, but subcutaneous and intramuscular inoculations produced only a local abscess in rabbits and guinea pigs; while inoculations into the pleural or into the peritoneal cavity killed them in twenty-four to forty-eight hours. Lignieres could not produce the disease by feeding cultures to poultry. Intraveneous injections of one to two cc of a peptone-free broth were not fatal for hens or rabbits, but would cause death in pigeons in less than twenty-four hours. Young cultures of his colon bacillus, growing in three percent hay broth, infected intravenously into five hens, killed two of them. One of the dead hens showed lesions identical with those which were infected naturally. He was always able to find the colon bacillus in the blood and viscera of the animals which succumbed to the experimental inoculations.

Sanfelice² reported subcutaneous injections of one cc of a broth culture of *Bacterium coli* would not cause death, but the same amount injected into the peritoneal cavity would be lethal for the pigeon. His attempts to immunize pigeons against this

organism were unsuccessful. Birds receiving the subcutaneous injections of one cc of a broth culture would die if he injected, intraperitoneally, the same dose eight to ten days later.

Martel⁶ reported small doses injected into the pectoral muscles would kill hens. On the fourth day following the injection, the blood would be filled with colon bacilli, and lesions would be found resembling those of natural infection. Martel succeeded in infecting guinea pigs, rabbits, white rats and mice with his organism.

Morse¹⁰ failed in reproducing the disease in chickens, pigeons and rabbits, but succeeded in producing death and characteristic lesions in mice and guinea pigs.

Zeiss¹³ was able to infect canary birds but failed in the case of guinea pigs.

Attempts on the part of the writers to infect hens artificially by injecting subcutaneously or intraperitoneally, two cc of a 24-hour broth culture were unsuccessful.

CASE REPORTS

Three outbreaks occurring on different farms have been selected as typical of the clinical forms, namely, the peracute, acute and chronic conditions.

Case I: Four dead hens and one live bird, from a flock of two thousand, were brought to the laboratory. The owner, a poultry dealer, stated that the flock was carefully culled twice each week, and non-laying birds, or those slightly off in physical condition, were removed and slaughtered for the market. The present disease made its appearance suddenly, and the first warning was the finding of the dead hens under the roosts or upon the nests. The owner stated further that there was no diarrhea among the remaining birds of his flock, but those remaining alive for several hours became partly paralyzed shortly before death. The live hen brought to the laboratory had been sick, apparently, a few hours. The bird was partially paralyzed, as indicated by lameness when it attempted to walk. Two of the birds that had died shortly before the owner left home were opened. They revealed the following lesions: liver and intestine congested, intestinal mucosa presenting areas of diffuse hemorrhage in duodenum and near the caecal openings. All other organs appeared to be normal. Cultures from the heart and liver gave pure cultures of *Bacterium coli communis*. In the

stained smear of the heart-blood, were observed plump, short bacilli. These are shown in the microphotograph, Fig. 1.

Case II: A dead pullet was received from a flock having a clinical history as follows: The first symptom noted by the owner was the tendency for the birds to sit around. Some of them became paralyzed to the extent that they were unable to move about to obtain feed. In this paralyzed condition the sick birds retained a normal appetite and the color of the comb was normal. Later a greenish-yellow diarrhea developed and, in the terminal stages, some of the birds became blind. The pullet had died while on the way to the laboratory and when opened for study revealed: heart normal, liver fragile and slightly congested, spleen enlarged, mesenteric blood-vessels dilated,

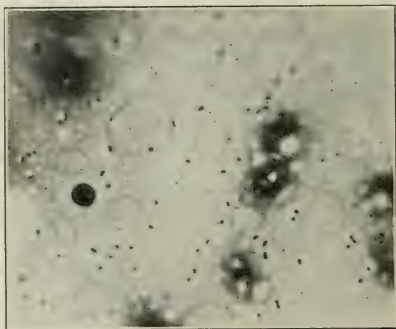


Fig. 1. Smear of heart-blood revealing short plump bacteria and bipolar organisms; x 1,000.

extensive inflammation of the mucosa throughout the entire length of the intestine. Deep mucous-membrane cultures, taken after first searing the superficial layer, gave a pure culture of *Bacterium coli communis*. Cultures from the heart, liver and spleen were sterile.

Case III: In this flock the owner first noticed several hens becoming lame, and some of them carried one wing in a low and abnormal position. He found, upon examining the hens, that they were very light in weight. The appetite was normal and there were no cases showing a diarrhea. The owner brought a hen, which had recently died, to the laboratory for diagnosis. Autopsy revealed all organs apparently normal, excepting areas of inflammation throughout the intestine. These areas were

not extensive and were visible only upon the mucous membrane. Deep cultures from the intestinal mucosa gave pure cultures of *Bacterium coli communis*.

A cultural and biological investigation of the three strains of *Bacterium coli communis* isolated from the three selected cases of infectious enteritis proved that the organisms belonged to this species of microorganisms. All three organisms were Gram-negative, slightly motile, non-spore-forming, rod-shaped bacteria. Blood smears stained 30 seconds with carbol-fuchsin showed some of the organisms to be bipolar, others to be oval, and some to be in pairs. The organisms did not liquify gelatin, but would coagulate milk by acid production. They were found to be methyl-red-positive when grown in Clark-Lubs medium. Dextrose, lactose, maltose and salicin were fermented with the production of acid and gas. No fermentation occurred in sucrose and dextrin broth.

TREATMENT

Very little information on the treatment of *Bacterium coli* infection may be gained from the literature on the subject. Dawson recommends medicinal tonics for renewal of the lost vitality, easily digested foods and careful housing. Morse recommends calomel in one-tenth-grain doses, as an intestinal disinfectant.

We have found considerable variation in the manner in which infected flocks respond to treatment. An intestinal antiseptic which seems to give good results in one outbreak may be absolutely worthless in another. This variation is doubtless explained by the thoroughness with which the treatment is applied, the sanitary conditions surrounding the flock, and the absence or presence of other diseases. When the treatment is given conscientiously, where no complications exist, and the birds are quartered under fairly good sanitary conditions, we believe lime-sulfur spray is almost a specific for *Bacterium coli communis* infections in poultry. Lime-sulfur spray is a standard spraying preparation for fruit trees. It may be obtained in concentrated solution or as the pure powder. The lime-sulfur is broken down in the intestine, liberating a form of free sulfur which is readily absorbed by the intestinal mucous membrane.* It may be given directly to the sick birds and is best administered by means of a medicine dropper in 2- to 5-cc doses of a 2 percent solution of

*Further studies of the action of lime-sulfur in the intestines are underway.

the concentrated solution. A one percent solution should replace the drinking water. In addition to this treatment, the birds should be taken from range, quartered in clean houses, on new, well-drained ground. Sick birds should be isolated. If permitted to remain on range, it is difficult to force the birds to drink the lime-sulfur water.

Copper sulfate has given very good results in treating gastrointestinal infections in poultry. After considerable experience with this metallic salt, we have concluded that the best results are obtained when it is administered in sour milk. Birds are very fond of sour milk and this agent alone has been recommended as a remedy for intestinal infections. Our idea in employing it, however, was to find a suitable vehicle for administering the copper sulfate. Birds refuse drinking water containing the copper sulfate, but when the chemical is mixed with sour milk, in the proportion of a teaspoonful (8 grams) of copper sulfate to each gallon of sour milk, a remedy is supplied which is greedily taken by all members of the flock.

When either of the chemicals mentioned fails to bring improvement, we have observed that, invariably, the birds are not receiving the treatment as directed or a disease complication exists in the flock. On one farm, where the treatment failed, we found a heavy infestation of intestinal parasites (*Ascaridia perspicillum*). In flocks being pushed for egg-production, it is advisable to reduce the grain ration, but allow plenty of green feed and moderate laxative feeds. Changing the flock to new ground and generally improving the sanitary conditions are valuable adjuncts to the treatment.

DISCUSSION AND SUMMARY

Within recent years, and especially during 1922, many Delaware flocks suffered heavy losses from a disease which the writers have characterized infectious enteritis, from the enteritis which seems to be the chief and only constant lesion encountered. The disease has assumed epizootic proportions among chickens, turkeys and ducks. Guinea fowls are apparently more resistant to the infection. The disease is caused by a virulent strain of *Bacterium coli communis*.

Few writers in this country have reported similar outbreaks. Infectious asthenia or "going light," described by Dawson, and caused by an organism which he named *Bacterium astheniae* is probably the same disease. His description of the organism

proves it to be *Bacterium coli*. Morse, however, reports an extensive outbreak among quail in 1906, caused by *Bacterium coli*. Reports of *Bacterium coli* infections are very numerous in European literature.

Infectious enteritis manifests itself as an acute and chronic disease. The principal symptoms are paralysis in the acute cases and emaciation ("going light") in the chronic form. Diarrhea is seen only in the terminal stages or where the enteritis is quite extensive.

Macroscopic lesions are usually absent in the early stages of the acute and chronic forms. After death, and in the terminal stages, enteritis, as indicated by diffuse hemorrhage of the intestinal mucosa, is a constant lesion. This may be accompanied by hepatitis and splenitis. In many cases the enteritis is the only lesion found.

Bacterium coli may occasionally be demonstrated in the blood, liver and spleen and usually in the intestinal wall. We have failed to demonstrate the organism in a number of outbreaks presenting a typical history and lesions of enteritis. This failure was due to failure in securing several birds for laboratory diagnosis, the absence of the organism in the liver or heart-blood, and too deep searing in the intestinal mucosa preparatory to culturing the intestine. Invariably, when we carried our observations to a number of birds, we secured the organism in pure culture.

A differential diagnosis may be made only by careful bacteriological studies. In the differential diagnosis, one must differentiate between botulism, caused by *Clostridium botulinum*, fowl typhoid, caused by *Bacterium sanguinarium*, fowl cholera, caused by *Pasteurella cholerae-gallinarum*, and fowl pest, caused by a filterable virus.

Different workers report conflicting results in their ability to reproduce the disease in experiment birds and animals. It appears that the infection is readily transmitted experimentally to guinea pigs, rabbits, rats, mice and pigeons, but rarely may it be transmitted to chickens.

Intestinal antiseptics are indicated in the treatment of infectious enteritis. We have obtained satisfactory results following the use of lime-sulfur given directly to sick birds, the same in the drinking water, and copper sulfate in sour milk. We believe we have effectively checked a number of outbreaks by the judicious use of these agents, together with improving the sanitation and regulation of the diet.

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KENTUCKY BREEDERS MEET

On March 8, 1923, a meeting was held at the Kentucky Agricultural Experiment Station for the purpose of discussing feeding and breeding problems. The feeders met in the forenoon and the breeders had their session in the afternoon.

Among those who were on the program of the afternoon session were: Dr. Cassius Way, of New York City, whose topic was, "Prevention and Treatment of Breeding Diseases of Cows and Mares," and Dr. W. W. Dimock, of the University of Kentucky, who presented "A Summary of Investigations on the Cause and Treatment of Sterility in Mares." Dr. Dimock also presented a report on "The Vaccination of Sows against Infectious Abortion." Drs. Way and Dimock also gave "Demonstrations of the Methods of Examining Mares and Cows for Sterility."

Prof. W. S. Anderson and Prof. E. S. Good presented the following subjects, respectively: "Value of Examining Stallions for Potency," and "Prevention of Infectious Abortion in Mares."

A letter recently received from Dr. C. J. Bonsfield, our Resident Secretary for Prince Edward Island, states that he has just experienced the most severe winter in the last fifty years. When his letter was written, the railroad had been blocked for the last twelve days. The snowfall for the winter was about eleven feet, about ninety per cent of which was still on the ground the middle of March.

ACRIFLAVINE

By D. H. UDALL,

New York State Veterinary College, Ithaca, N. Y.

Acriflavine and proflavine are described as follows in *New and Nonofficial Remedies, 1922*: "Acriflavine and proflavine are prepared from acridine, a base obtained from coal tar; the acridine derivatives are mostly yellow dyes—acridine dyes—to which the term 'flavine' has been applied ('flavine' should more correctly be applied to a vegetable coloring matter) . . .

"A considerable number of bacteriologic and clinical reports of these substances have appeared; however, the results of the studies are contradictory and judgment as to the therapeutic value of these new antiseptics must be postponed."

ADMINISTRATION

In the ambulatory clinic of the New York State Veterinary College the use of acriflavine has become extensive during the past two years. In the treatment of general septicemic conditions, such as metritis and mastitis in cows, it is administered per vein in doses of 80 cc of a 1:500 solution in sterile water. Before injection, a bottle of the solution is set in a pail of warm water until the temperature approximates that of the animal body. The jugular is now raised by means of compression with a one-half inch rope snubbed tightly around the lower part of the neck. After allowing sufficient time for the jugular to become prominently enlarged it is pierced with a two-inch, 16-gauge slip needle. Pressure from the rope is now relaxed and the solution injected with a ten-, twenty- or forty-cc syringe; we use either a Record or a Champion. In young calves about twenty cc is injected.

In acute or chronic metritis it is injected directly into the uterus, after removal of all inflammatory exudate by means of a saline douche. In this case it is used in a 1:500 aqueous solution. Four to sixteen ounces are left in the uterus according to the size of the cavity. More recently, and to a very limited extent, a 1:1000 solution of acriflavine in glycerin has been used for metritis. In the search after an ideal antiseptic for disinfection of the uterus, between the dates of parturition and first service, this combination is receiving a trial. Such routine use of any

disinfectant is of course limited to herds suffering from a high per cent of metritis and sterility.

In severe septicemia, as in metritis or mastitis, the dose is often repeated daily. It has not been observed that daily repetition of 80 to 100 cc of a 1:500 to 1:1000 solution per vein has any ill effect upon bovines. It is probable that an animal may safely receive much larger amounts.

RESULTS

An accurate estimate of the therapeutic effect of any chemical injected into the circulation is difficult; this depends upon extensive clinical experience as well as experimental tests. Enough experience has been obtained, however, to encourage us in the hope that its effects are decidedly beneficial. The most strikingly apparent effects have been observed in the treatment of metritis and mastitis associated with general symptoms. It frequently happens that within twenty-four hours after the injection of acriflavine both the general and local symptoms in mastitis have improved. In acute mastitis, with no general reaction, a similar local improvement following injection is not infrequent.

In this report, written at the request of the Editor for a brief description of its indications and method of administration, it is not possible to submit detailed tabulations based on case reports. It appears to be a useful drug in the treatment of both local and general infections. In the treatment of metritis it has a distinct advantage over iodoform with respect to its influence upon the milk. It does not appear to have any prophylactic effect in the control of diseases of the new-born.

The use of the word "alcohol," without qualification, in the sale of anti-freeze preparations is prohibited. A Federal regulation requires the use of the complete description, "denatured alcohol."

Fluidextract of cascara sagrada can be diluted and a clear mixture obtained without the use of alcohol by adding to one ounce of the fluidextract one fluidounce of glycerin and two fluidounces of water.

Ointments that have become granulated, but are not rancid, can be brought back to their original condition by melting and then stirring until cool.

CLINICAL AND CASE REPORTS

(Practitioners and others are invited to contribute to this department reports of unusual and interesting cases which may be helpful to others in the profession.)

SUSPECTED NITRATE OF POTASH POISONING¹

By J. A. WEBB, London Grove, Pa.

On the 13th of September of last year I was asked by Dr. J. T. Quarll, of Avondale, Chester County, to visit a small herd of grade Guernsey cows. The history of the cases as told by Doctor Quarll and the owner was as follows:

Of the four cows in the herd, three showed almost at the same time, a pronounced hemoglobinuria, accompanied by a marked bloody tinge to the milk. There was a marked loss of appetite, with a resulting decrease in milk flow. One cow died very suddenly after a day's illness, and on post-mortem Doctor Quarll found little to assist him in making a diagnosis of the cause of the condition, except a small, slightly inflamed area of the mucous membrane of the fourth stomach. The kidneys showed evidence of an acute inflammation, and the bladder contained urine of a dark, red color.

When I went to see them, the owner drove the three remaining cows from the pasture to the barn, and as they came toward me they carried their heads up, with ears held at a natural angle, and switched strenuously at the ever-present flies which we have in September. One of them stopped two or three times in an effort to void urine, passing a very small quantity. After being fastened in their stalls, all three showed normal temperatures, with a slightly increased pulse and respiration, which I felt was due to the excitement of being brought from the pasture and the presence of strangers. There was no tenderness over the loins and no swelling or sign of an inflammatory process in the udder, although the sample of milk taken from one was quite pink, due to the hemoglobin in it. On catheterizing the cow which had made several attempts to void urine, I was surprised to find that the bladder contained over a quart of dark, red urine. The bladder was partially paralyzed.

Specimens of urine from one cow and milk from another were

¹Presented at the fortieth annual meeting, Pennsylvania State Vet. Med. Assn., Harrisburg, Pa., Jan. 23, 1923.

taken to the laboratories at Philadelphia, on the following day, and no evidence of any organism was found. The symptoms of the cases were then described to Doctors C. J. Marshall and L. A. Klein, and the latter's parting advice was, "See whether they have had access to commercial fertilizers, and especially fertilizers with a high nitrate of potash content."

The following day Dr. Quarri and I again visited the farm and walked over every pasture, but could find no flower or shrub uncommon to pastures at that season of the year. On returning to the barn, I entered the horse stable, as I had seen two cows pass through the horse stables, and from there to their cow-yard at the time of my first visit. In an empty horse stall, near the heel-post of the partition, were two bags partly filled with fertilizer. One of them had been tramped on recently and torn, but the portion of the contents that had fallen out was evidently not all there. The owner then said that the cows were in the habit of stopping in the horse stable, and particularly in that stall, as salt was sometimes kept in the feed-box, and the cows had the boards licked clean in trying to get a taste of salt. In backing out of the stall, the fertilizer bag had probably been torn and, as the fertilizer was salty in taste, I think that they ate enough of the phosphorus and potash salts to cause the death of one and the symptoms described in two of the remaining three members of the herd. Were we correct in believing this to be the case?

BLACKLEG AGGRESSIN IN SHEEP

By HADLEIGH MARSH

Montana Livestock Sanitary Board, Helena, Mont.

The occurrence of blackleg in two different bands of sheep has been reported by this laboratory.^{1,2} During the fall of 1922 blackleg again caused considerable loss in sheep on the same ranch from which it was reported in 1919.

The history in this case was as follows. The lambs were brought in from the summer range in the latter part of August, and put in the bottom-land meadows at the ranch. There were 250 ram lambs in one field, and in other fields there were ewes, ewe lambs, and wether lambs. Later the ram lambs were split

¹Marsh, H., An outbreak of blackleg in sheep. *Journal of American Veterinary Medical Association*, V. 9, 1919, No. 3, p. 319.

²Marsh, H., Another case of blackleg in sheep. *Journal of American Veterinary Medical Association*, V. 15, 1922, No. 2, p. 217.

in two bunches, about half of them being moved to a field on the bench just above the other field. After the bunch on the bench field had been there about six weeks they began to die, one at a time. Up to November 29, between ten and fifteen lambs had died out of the bunch of about 125 in the bench field. There had been no loss in any of the other sheep on the ranch, with the exception of one wether lamb which was lost out of a bunch that had been on this same field earlier in the Fall.

On November 28 the owner expressed a dead lamb to the laboratory for diagnosis. On post-mortem examination we made a diagnosis of blackleg, subject to confirmation from a study of the cultures. On November 29 we vaccinated the 250 ram lambs with blackleg aggressin, using 3-cc doses. At that time we saw only one lamb showing symptoms that might be due to blackleg.

Study of the cultures from the sheep examined at the laboratory confirmed the diagnosis of blackleg. The *Bacillus chauvei* was recovered in pure culture from the heart-blood of a guinea pig inoculated with material from the affected muscle of the sheep.

On February 1, 1923, two months after the sheep were vaccinated, the owner reported he had had no losses since vaccination. The conclusion would seem to be justified that the aggressin had protected the sheep against the infection, and we consider this experience a valuable field test on the efficacy of blackleg aggressin in protecting sheep against blackleg. This supplements and confirms the results we obtained experimentally on a few sheep, in a test carried out in August, 1920, in cooperation with Dr. Howard Welch, of the Montana Experiment Station.³

MICHIGAN TO KEEP TAB ON HOG CHOLERA VIRUS

The Michigan Bureau of Animal Industry intends to keep a very close tab on the use of hog cholera virus. The following regulation has been issued by State Veterinarian Killham.

"Any person administering the anti-hog cholera serum and virus or simultaneous treatment to any hogs or any person administering the anti-hog cholera serum-alone treatment, to any hogs infected with, or exposed to, a contagious or infectious disease, shall report such treatment to the Department of Agriculture, within five days, indicating in the report the date of treatment, the owner's name, address, county and township, the number of hogs on the farm or premises, the number of sick hogs treated, the number of well hogs treated, the number of hogs that died before treatment, the number of hogs too sick to treat, the number of hogs not treated for other reasons, the amounts of anti-hog cholera serum and hog cholera virus used, and the license and serial numbers of each product."

³Welch, H., and Marsh, H., Vaccination for blackleg in sheep. Journal of the American Veterinary Medical Association, V. 11, 1921, No. 6, p. 715.

AMERICAN VETERINARY MEDICAL ASSOCIATION
Proceedings of Fifty-ninth Annual Meeting, St. Louis, Mo.
August 28 to September 1, 1922

(Continued)

LARGE-ANIMAL CLINIC

WEDNESDAY AFTERNOON, AUGUST 30, 1922

(Continued from p. 686, February Journal)

CHAIRMAN KINGMAN: Dr. Kaupp has just one more phase of his program to present.

DR. KAUPP: Dr. Saunders has arrived, and he will take about ten minutes to demonstrate to you the effects of his toxic *larvae*. Dr. Saunders.

DR. SAUNDERS: It gives me great pleasure to speak to you fellow scientists and workers in this field, the field of medicine and veterinary science that are now closer together than ever before.

Now, Dr. Eckland, my collaborator, has there a number of animals, some of them killed by what we have named the botulinoid Bengston. The reason we give this title is that Miss Bengston, working under Dr. McCoy, in Washington, isolated the organism from material which I sent to Washington a year ago, and it is a botulinoid organism and yet doesn't exactly correspond to the description of *botulinus A* or *botulinus B*.

Moreover, the embryonic green fly is the host of this newly discovered organism. It grows in the embryonic green fly and the mother fly has to feed upon this toxic, virulent material, a "limberneck" chicken for instance, at least three days before the toxic virulent *larvae* are deposited.

Now, I lost a great deal of time in working on the supposition that all green-fly *larvae* taken out of a "limber-neck" carcass must necessarily have this organism, but they do not.

The other day we went up into the county of St. Louis, where a number of geese, chickens and young pigs had died, and expected to get a vast store of these precious *larvae*, and we got thousands upon thousands of them, and not a one of them is toxic or virulent, for the simple reason that we didn't happen to get any *larvae* that had been deposited by a mother fly that had fed upon the material long enough beforehand. I tell you that, so that you may escape disappointment.

Now, the toxin of this organism acts very similarly to the *botulinus* toxin, only it is not so rapidly fatal; not only that, different animals have a very different susceptibility to it. It takes a great many of these *larvae*, for instance, to kill an adult fowl. It takes only a fraction, say one or two *larvae*, to kill a guinea pig, and no guinea pig that is in the least affected by it ever recovers. A great many chickens recover, but where on a farm all the fowls die without a single recovery, it is not this *Bengston* botulinoid; it is the *botulinus*, type A.

I have traced up epidemics, and in one epidemic on one or two farms it was a *botulinus*, type A, as Dr. Graham afterwards determined, that not only the *larvae* but the earth in which the *larvae* were buried all contained *botulinus*, type A, and in this same neighborhood, a few weeks later, I got the typical *Bengston* botulinoid organisms.

Now, this organism is certainly of the *botulinus* family, but it is primarily a parasite or a saprophyte. We know that primarily the type A *botulinus* is a toxicogenic saprophyte, and becomes a parasite only by virtue of its attendant toxin, but we haven't determined yet whether this is primarily a parasite or a saprophyte; probably primarily it is a parasite.

Now this organism is responsible for what I have written about for the last ten years repeatedly under the title of "The Green-fly, or *Lucilia*, Epizootic."

At the University of Minnesota, three years ago, they followed up these experiments and came to the conclusion that the posterior paralysis of hogs is nothing more nor less than the same disease as "limber-neck" in fowls.

Now, in guinea pigs the paralysis is almost always in the forequarters, but in hogs it is always primarily in the hind-quarters.

Now, where all the hogs die in a night, on a farm, it is not the green-fly epizootic, it is not the *Bengston* botulinoid, it is the type A *botulinus*, but where on the farm the brood sow remains well, but all her pigs die from causes absolutely unexplainable, and if you find there is a lot of "limber-neck" on that farm, you may know that you have then the green-fly epizootic, which is the *Bengston* botulinoid. An adult hog will not succumb to this organism, but the sucking pigs do.

We have now at our station one single survivor of a brood. All the rest died from getting the milk of the mother. She had got infected from eating a "limber-neck" cock.

Now, to give you a description of the difference between the effects of this organism and *botulinus*, type A, a physician told me that he was at his father's, taking lunch, in northern Washington, two or three years ago, and they opened a can of peas. He noticed that the can was swelled, and he said to his mother, "Don't put those peas on the table. They are dangerous." The mother threw them out to the chickens (they had a fine lot of chickens there), and within three hours not a single chicken on the place was alive.

Now, if that had been the *Bengston* botulinoid those chickens would not all have been dead. Some would have been dead and some would have recovered.

Now, we want to inoculate a monkey here. Dr. Eckland will do that.

DR. ECKLAND: Now this monkey that is dead, last night at eight o'clock received an intraspinal injection consisting of one cc of a culture of an organism which we isolated from another monkey that was fed the *larvae* of green flies. He had one cc intraspinally, and he died about ten o'clock this morning of typical paralysis.

The guinea pig had one cc of the same culture in the peritoneal cavity, and the pig that is very sick there will die eventually, probably tonight or tomorrow. He had one cc of a filtrate of this culture, the culture being passed through a filter and the filtrate injected in the pig in the peritoneal cavity.

DR. SAUNDERS: Now, I would give half the dose. How much did the chicken get?

DR. ECKLAND: It had one-half cc and the chicken, as you now can see, is sick.

DR. SAUNDERS: It takes a vastly larger dose for fowls than it does for guinea pigs.

DR. ECKLAND: The filtered culture will act more slowly. Of course, the straight culture we have here is very rapid in effect.

DR. SAUNDERS: And it is a gas-producer.

DR. ECKLAND: You will notice how the guinea pig is bloated.

DR. SAUNDERS: Now, we had a goat to die on Sunday afternoon that received intramuscularly 1 cc in the deltoid muscles, on Friday evening, and within forty hours the animal was dead, and another was injected the same way, with the same syringe, and is still well. He hasn't shown any signs of illness at all. This monkey will get half the dose the dead monkey got, because

we want it to live longer, so that you can study the animal tomorrow.

DR. FERGUSON: How are you administering that?

DR. ECKLAND: Intraspinally. The injection is one-half cc. We hope the animal will live until this time tomorrow afternoon, and at that time show the effects of the dose. He will show paralysis, probably of the forequarters.

QUESTION: What is the object of giving it intraspinally?

DR. ECKLAND: The organism seems to thrive best in the spinal canal. After the monkey has been killed by feeding it green-fly *larvae*, and cultures taken from the spinal canal, these cultures will produce the organism more rapidly than any of the other cultures.

The organism, as we said, is a bacillus and it is extremely virulent, as you can see from the effects on this animal.

CHAIRMAN KINGMAN: Remember that we are infringing upon another man's time, and we will have to close as soon as possible. (Applause). We have saved the best for the last. Dr. Raffensperger will take up the rest of the time as he sees fit. (Applause).

DR. H. B. RAFFENSPERGER (Bureau of Animal Industry): I have talked around here on worms so long that I feel a little bit wormy myself. Yesterday, when I met the Chief of the Bureau, he said, "Professor." Of course he wanted to say "Professor Worms." I knew what he meant.

I hardly know what I ought to say this afternoon. However, the first thing, I will speak on the clinic that I want to present, and in speaking of that I will be able to present the life cycle of this particular parasite.

I prepared the cultures that I gave to these pigs, by taking the uterus and squeezing out the eggs, and then putting them in a two percent formaldehyde solution. Then I put them in an incubator, at 23-25°C, and if you hold them at that temperature, at the end of three weeks you will get active vermiform embryos inside of the egg shell.

Now one thing is rather peculiar about these eggs. They will not develop at the temperature of the animal body; they must develop at a temperature lower than the animal body. You can take these eggs and put them at a temperature of 37.5°C, and you will get up to about the sixteenth cell division, and then they stop and degenerate, and they will not develop an active embryo inside; if you put them at a temperature of 37°, their growth is entirely inhibited, and if you hold them long enough, they are

destroyed,—you will get no cell division. So these eggs must be developed at a temperature lower than the animal body. You can see that the mudhole and the manure pile are very good places for the development of these parasites.

Now you can feed a large number of these newly-laid eggs in the resting stage to a pig and you will get no infection. Before these eggs are infective, they must contain an active embryo inside the egg shell, so that is what I had when I fed these pigs these eggs.

These egg cultures were made on May 16th, and I fed them on August 22d, so you can figure how long they were held in the two percent formaldehyde solution. We can keep them alive around two years. There have been some investigators who have kept them alive for five years. I couldn't do that, but under certain conditions they can be kept alive for two years.

Now when these embryonated eggs are fed to a pig, they do not develop in the stomach, but they pass into the intestinal tract, then they bore their way out of the egg. Then these free *larvae* are taken up, probably through the lymph spaces, find their way to the lymph-nodes, make their way into the circulation, and then pass to the liver. Now Dr. Ransom and Miss Cramm have been able to trace them that far; they were able to observe the free *larvae* in the interlobular vessels of the liver; they were able to observe the *larvae* midway in the lobule of the liver, between the interlobular and the intralobular vessels; they were able to observe them in large numbers in the right side of the heart, and, of course, we can always find them in the vesicular portion of the lung, as well as in the bronchi and trachea in our infected animals, so you see that the course of migration has been pretty well traced out.

Now, then, as they decrease in numbers in the liver, they will increase in numbers in the lungs, so that again points to the circulation. After they get into the vicinity of the lungs you can see it is simple for them to creep up into the bronchioles and make their way into the trachea.

These pigs have been coughing some, as you notice, and without a doubt we will find in the mucus that has accumulated in the trachea a considerable number of these free *larvae*, and they have made their way from the intestinal tract through the circulation into the lungs, and then after they are swallowed, they will pass into the stomach, and then into the intestine, and there settle down and develop into full-grown ascarids.

We have observed that you may sometimes get a very heavy infestation in the lung; you may get a very pronounced case of rapid breathing, and yet if you keep that particular pig a sufficient length of time, you may find only a few round-worms in the intestinal tract. They do pass out with the feces in large numbers, especially where you produce a heavy infestation in that way and they survive, so you can see the reason why we get cases like we have there, where the intestine is almost occluded.

Another thing I want to say is this: no pig has ever passed through a severe case of thumps, that did not get a set-back. Now I didn't infect these very heavily, for a purpose (I didn't want to kill them), or we could have had a very beautiful case of rapid breathing, but where the serious trouble comes in is in the secondary infection. Now when you will observe these lungs, you will find that you will have a considerable edema, and you will have well distributed ecchymotic spots throughout the lungs. As these pigs do not show very severe symptoms, you will probably have a considerable edema, and much of the hemorrhage may have faded out; but without a doubt we will be able to demonstrate in the mucus the presence of the free *larvae*, but where the serious trouble comes in is when you get secondary infection. Now we very frequently get that in our experimental pigs; after the free *larvae* have passed out, the irritation that has been produced in the lungs will set up a secondary infection, or will prepare the way for secondary infection, and you will get well-distributed small abscesses throughout both lungs. When you get that condition in the pig, you have a serious condition; that pig will never do well, and might as well be knocked in the head.

Now I saw a pig here a little while ago that was brought in from the country. I don't know where it came from, but it was diagnosed as a case of chronic enteritis, but it was thumping considerably. Now I would almost venture the assertion that I would be able to demonstrate in those lungs the presence of the free *larvae*. Now I don't want you to understand me, that necrotic enteritis has any connection with *Ascaris* infection, but I want to say this: where you have conditions sufficiently filthy that will harbor the presence of parasite eggs, you have conditions sufficiently filthy that will harbor other microorganisms that affect the pigs, and for that reason when we find lung infection and ascariasis present, we usually find these other conditions

that go with it, such as "bull-nose" and necrotic sore-mouth and necrotic enteritis. I want to stress that where you have conditions sufficiently filthy to harbor these parasites, you have conditions sufficiently filthy to harbor these diseases, and so when we started out in our investigational work toward the eradication of these conditions in the suckling pig, we set up a standard of sanitation that was sufficiently high, one that would do away or would reduce parasitic infection to the minimum, and when we did that thing, these other conditions disappeared.

Now when I make that statement, I make it based upon facts in field experiments. When we first started our work in McLean County, we had about fifteen farms that cooperated with us, but we went and selected the farms where they were ready to quit the hog business because of the bad luck they had. This is the history I would get: The sows would throw a litter of pigs, splendid, fine-looking pigs, and before weaning time they would dry up and die. That was the thing that would make them become discouraged. They threw up their hands and said they were willing to quit the hog business. We went on those farms with them and worked out a system of raising hogs. The first year we raised only between five and six thousand; last year we raised about seven thousand. This year we have thirty farmers cooperating and we have between eight and nine thousand pigs that we have raised under the so-called "McLean County system" of hog sanitation.

Now if you were to go with me into McLean County, I could take you to these various farms that are cooperating with us, and I would defy you to go among those herds and pick out a case such as you see over here—a rough-haired hog, sunken flanks, or diarrhea, or having the so-called enteritis or "bull-nose," and that sort of thing. We have not been troubled with these conditions, and the standard of sanitation we set up is sufficient to control these other conditions.

Now, then, you may wonder why we used the method we do, such as washing the *mammæ* of the sow, and such as scalding out the farrowing pen. We do that because we don't know anything else to do. As I have said to various audiences, I don't know of any antiseptic that will readily destroy the parasite egg. We can incubate them in 70 percent alcoholic solution, or in a 10 percent dichromate of potassium solution, or in a 1-1000 to 1-2000 solution of bichloride of mercury, and the solution we have used is the one I have just spoken about, the two percent formalde-

hyde solution, so you see antiseptics do not readily affect them, so we had nothing else to do but use hot water, because it will effect their destruction.

Another thing, there is no hope of freezing them. I have taken the parasite eggs and placed them in a freezer at from two to sixteen degrees below zero, for forty days; at the expiration of forty days we defrosted the parasite eggs and put them in a proper culture medium, and they went ahead and developed. You see that cold weather does not affect them. So the only thing we have to depend upon is the hot water; that is the reason we scald out the farrowing pen. The lye doesn't destroy them; we simply use it as a cleanser.

There is some hope probably in phenol and in cresylic acid. I have taken a three percent solution of cresylic acid, and suspended the eggs in it for five hours and effected their destruction, or I have taken a five percent solution of carbolic acid, phenol solution, and suspended the eggs in it for ten hours and effected their destruction; but when you go to spray a pig pen, you can not bring the disinfectant in contact with the egg, so what are you going to do? We had nothing else left to do but simply use the hot water, and we simply cleansed the sow because she is dirty and because on the *mammæ* of the sow there are plenty of *Ascaris* eggs. She has been around in the dirty old hog lot, and you want to get rid of them, because of the serious condition that the passing of these *larvæ* through the lungs will produce. I want to say right here that the few worms you get in your intestinal tract don't do a very great deal of harm, unless they have invaded the bile duct and produced jaundice or secondary abscesses by their migration.

Just as soon as the pigs are able to suck their mother, we cleanse the *mammæ* of the sow, and after about ten days we take them out into the clean pasture, whether it is January or February, it matters not, and put them in a house where pigs have not been before, and that is all we have to do. Of course, we get the feed and water to them and good results follow. That is a very simple method; the only objection you will find is that it is too much work. If your clients will follow that only half-heartedly, of course they will not get very good results, but if they will go the whole way, I am positive these pig ailments will be largely done away with—those which have been referred to today.

If there are any questions you would like to ask before we kill

the pig and demonstrate the presence of the *larvae* I would be glad to answer them now.

QUESTION: How do you manage the washing of the sow?

DR. RAFFENSPERGER: We put her in a crate and just use warm water and soap.

QUESTION: If you take a dirty old hog lot and turn it under, how long is it before it is safe to put hogs in again?

DR. RAFFENSPERGER: That is a hard question to answer, but we feel this way: after the hog lot is seeded down to grass, after you have a good stand of grass, it is pretty safe. I am doing some work on that now; I have buried some eggs in my garden at home and I have been looking at them. I will say this: I kept them all winter and when I dug them up this spring they were still alive. I have got four pails that I am going to resurrect some of these days and see what has happened to them during the summer months; but you have a dilution there.

QUESTION: Does whitewash kill the eggs?

DR. RAFFENSPERGER: No, sir.

QUESTION: What is the temperature of your water?

DR. RAFFENSPERGER: Eighty degrees centigrade, if the individual egg is exposed, but we just use boiling water, and plenty of it.

QUESTION: How do you handle the creeks and the branches in the pastures where the hogs go and make wallowing holes?

DR. RAFFENSPERGER: We have not paid so much attention to that. The eggs will gravitate to the bottom and it would have to be a very small stream and would have to be used a great deal to be very much contaminated.

QUESTION: What effect does oil have on the eggs—crude oil medicated with cresylic acid?

DR. RAFFENSPERGER: I have never tried that; I have tried the cresylic acid, but not the combination.

DR. RAFFENSPERGER: Now, gentlemen, there is something to this, and if you don't believe it, just come over to McLean County and see for yourself. Allen Brown's farm has 2300 pigs this year, and he has been visited by men not only from Illinois, but from Iowa, and I asked a bunch that visited those farms just two weeks ago to pick out a runt, and they couldn't do it; the pigs haven't been picked, they are there just as they came.

ADJOURNMENT.

(*To be continued.*)

OTHER MEETINGS

VETERINARY MEDICAL ASSOCIATION OF NEW YORK CITY

The regular monthly meeting of the Veterinary Medical Association of New York City was called to order by the President, Dr. J. Elliott Crawford, in the Academy of Medicine, 17 West 43rd St., on Wednesday evening, Jan. 3rd, at 8:45 p. m.

The minutes of the December meeting were read and approved. The President, in a well-composed address, expressed his appreciation of the honor of being unanimously elected President of this Association, and of his willingness to discharge the duties of the chair, in an impartial manner, and with courtesy and consideration to all.

He called attention to the weaknesses of the Association, in that we have about 75 dues-paying members, out of about 300 eligible veterinarians, within the radius of our Association. Also, that the number of new members added each year is being offset by the number of old members losing interest and failing to pay their dues. As a remedy for this condition he asks each member to put his shoulder to the wheel, eliminate all obstacles and develop a unity capable of attaining our objective, of having every worthy veterinarian in our territory a member of this Association.

Dr. Crawford referred to the accomplishments of this Association in the past, but added that more is demanded of it in the future, in shaping the course and leading the way to our progress. This can be done only by a stronger organization, working with a united thought. The stronger we become individually and collectively, the greater good we can accomplish. He asked the members to express their views more freely on the subjects discussed, and to aid the program committee in their work of preparing entertainment. The president closed his address by wishing all the members a prosperous and happy New Year.

Dr. William J. Lentz, of the University of Pennsylvania, addressed the meeting and gave a most instructive and interesting talk on various diseases of the dog. The doctor has had a wide experience, and while he could not cover many diseases, he did give us food for thought in handling some diseases.

He spoke of the *Bacillus bronchisepticus*, but stated that it

was almost impossible to create the disease with this organism, and that the bacteriologists have not yet gone far enough in research work with dog diseases. The speaker referred to *dis-temper* as too broad a term, and in a way divided the disease into three forms, outlining the symptoms of each, and the line of treatment, both dietetic and medicinal, that he had found most satisfactory in dealing with the several forms.

Dr. Lentz referred to *trypan blue*, a German preparation, as of *no value*, after a series of experiments. He referred to serums and vaccines as of practically no value.

The next subject discussed was "Helminthiasis." Carbon tetrachloride was indicated for hookworms, but in some old cases, chenopodium 15 min. and chloroform 2 min., to 1 oz. castor oil, was found to be more valuable. In tapeworm treatment, arecoline hydrobromide $\frac{1}{4}$ gr. was found satisfactory. Santonin $\frac{1}{2}$ gr. and calomel $\frac{1}{4}$ gr. were indicated for whipworms.

Dr. Lentz gave a very interesting talk and outlined a simple technic for performing cesarean operations, but did not advise such an operation where we have a high temperature, with any indication of a septic condition.

Dr. Robert S. MacKellar called the attention of the Association to the Conference of Veterinarians, to be held at Ithaca, N. Y., Jan. 11-12, and the President urged all members to attend if possible.

Dr. George Watson Little and Dr. Louis A. Corwin were unanimously elected to membership.

The President named the following committees for the year: Program: Drs. Roy W. Gannett, Chairman; Bruce Blair, Alex. Slawson. Legislative: Drs. W. Reid Blair, Chairman; Robt. S. MacKellar, Wm. H. Hayes. Prosecuting: Drs. Jos. Mulcahy, Chairman; Jacob H. Cohen, O. R. Scheuler, E. I. Altman, Thos. E. Booth.

It was regularly moved and seconded that a rising vote of thanks be extended Dr. Lentz, for his most interesting and honest talk.

No further business appearing, the meeting adjourned.

FEBRUARY MEETING, 1923

The regular monthly meeting of the Veterinary Medical Association of New York City was called to order by the President, Dr. J. Elliott Crawford, in the Academy of Medicine, 17

West 43rd St., on Wednesday evening, Feb. 7th, at 8:45 p. m. Fifty members and visitors were present.

The minutes of the January meeting were read and approved.

Dr. H. J. Milks, of Cornell University, Ithaca, N. Y., gave a most interesting and instructive talk on diseases of the dog. He first spoke on skin diseases, classing them as parasitic and non-parasitic. The non-parasitic he divided into acute and chronic, dry and moist, outlining treatment for each kind. The parasitic skin diseases discussed were ringworm and the various forms of mange. Dr. Milks referred to ear-mange as a rather common disease of both cats and rabbits. He briefly touched upon the various intestinal parasites, and gave appropriate treatment for each.

Dr. Frank H. Miller was the next speaker of the evening and gave a great many valuable suggestions in handling the various diseases of the dog. He spoke of the biologics used in the treatment of distemper as of some value, in his opinion, and cited a number of peculiar cases of this disease, especially in police dogs, where in 24 hours they would develop a quick pneumonia and die. On autopsy these cases would show the pneumonic areas and a pronounced edema of the lungs. He stated that this disease has been causing a great hardship upon dog owners, and something should be done to prevent the importation and exportation of dogs suffering with distemper.

Dr. Miller then referred to various skin diseases, touching upon difficulties met in successfully treating follicular mange. He cited one case of this disease in a horse. He cited several cases of mange in cats, where the disease had been transmitted to the owners. He called attention to the need for publicity in the matter of vaccination against rabies. Discussion on this subject was postponed until the next meeting.

Dr. W. Reid Blair was the next speaker called upon, but owing to the lateness of the hour his remarks were brief. Dr. Blair called attention to the importance of the microscope in the diagnosis and treatment of skin diseases of small animals.

Dr. Charles V. Noback of Columbia, South America, displayed maps and discussed the veterinary situation in that country, but owing to the late hour discussion was postponed until the March meeting.

It was regularly moved and seconded that a vote of thanks be extended to Drs. Milks, Miller, Blair and Noback for their valuable and instructive discussions.

Dr. E. L. Sanford, Glen Cove, L. I., was unanimously elected a member of the Association.

No further business appearing, the meeting adjourned.

C. G. ROHRER, *Secretary.*

B. A. I. VETERINARY INSPECTORS' ASSOCIATION OF CHICAGO

The following is a report of the meetings held during the past month by the school of instructions for the veterinary inspectors as instituted by Dr. W. N. Neil, Inspector in Charge of the Chicago Station, which meets in the Government Office of one of the local plants each Monday morning. The Chicago Branch of the National Association of Bureau of Animal Industry Veterinarians prepares a program for several weeks in advance, on various subjects relating to meat inspection. All subjects are presented by inspectors who have had considerable experience in the Bureau. Various pathological specimens of interest, as well as rare conditions found by the inspectors, are collected during the week and held under refrigeration until the following Monday morning, when diagnoses and discussions are made.

On January 8, 1923, Dr. L. E. Day, gave a very interesting and instructive talk on "The Histology and Post-mortem Changes of the Skeletal Muscles."

On January 15, 1923, Dr. W. H. Daly, President of the Local Association, presided at the meeting. Dr. G. W. Knorr read a paper on "Ante-mortem and Its Relation to Post-mortem Inspection."

On January 22, 1923, Dr. L. E. Day, gave a talk on "The Adipose Tissue of Various Animals." Dr. Day's talk covered the composition and various physiological and pathological changes of adipose tissue.

On January 29, 1923, Dr. W. N. Neil, Inspector in Charge of Meat Inspection at the Chicago Station, gave a very instructive talk on "Packing-House Sanitation."

On February 5, 1923, Dr. L. E. Day, gave a talk on "Malformations, Dissolution of Continuity, Atrophy and Hypertrophy." Dr. L. A. Merillat was a welcome visitor, and he addressed the meeting on the subjects of "Professional Veterinarians" and "The Officers' Reserve Corps."

On February 12, 1923, we had an open meeting for the discussion of the activities of the Association, and Dr. R. C. Livers

talked on the subject of "The Lymphatic System and Its Relation to Post-mortem Inspection." Lieutenant-Colonel W. P. Hill, of the Sixth Area Depot, was a visitor at this meeting, and Dr. W. N. Neil extended to Colonel Hill and all of his associates a warm welcome to all of our meetings.

L. T. HOPKINS, *Secretary*.

KENTUCKY VETERINARY MEDICAL ASSOCIATION

The winter meeting of the Kentucky Veterinary Medical Association was held at Louisville, Ky., Feb. 7 and 8, 1923.

The meeting was called to order by Dr. J. K. Ditto, of Pleasureville. In welcoming the Association to Louisville, Dr. Calldemeier extended an everlasting welcome to the members and extended an invitation to make Miller and Calldemeier's Hospital our headquarters when in Louisville. Dr. D. E. Westmoreland responded in his usual witty manner, including a few stories that were timely and well chosen. Dr. Ditto thanked the Association for the honor that had been bestowed upon him by the members in electing him to the highest office, at the Owensboro meeting, and gave fair warning that he would continue to be a live wire in the organization.

Dr. Robert Green, with the U.S.B.A.I. force on hog cholera work in the mountains of Kentucky, read a very interesting paper on "Hog Cholera and Sanitation." His paper was thoroughly discussed by Dr. W. W. Dimock, of the University of Kentucky, whose discussions brought some very interesting information to light. Dr. Wm. Coffee, of La Center, and Dr. J. K. Beyer, of Henderson, discussed the paper from the view-point of the practitioner, which proved very interesting.

Dr. W. H. Simmons, State Veterinarian, spoke on "Progress of Tuberculosis Eradication Work in Kentucky." He advised the practitioners that the accredited herd work was being turned over to them immediately upon completion of their accreditation. He also outlined the manner of making appraisals. A general discussion followed, in which many points of interest concerning the work were brought out.

In the absence of Dr. W. F. Biles, Inspector-in-charge of the U.S.B.A.I. force in Kentucky, Dr. Allen Barnes, Assistant to Dr. Biles, discussed the ophthalmic and intradermal tests.

Dr. E. A. Caslick, Assistant Veterinarian, Kentucky Agricultural Experiment Station, read a very interesting paper on "Fil-

aria in the Ligamentum Nuchae of the Horse." A general discussion followed.

Dr. C. H. Palmer, of Shelbyville, spoke at some length on "Results of Treatment of Abortion and Sterility in Cattle." This being a subject of very great interest, his paper was thoroughly enjoyed. He gave the Association the benefit of the results of all his work in a very concise manner. Dr. H. Gieskemeyer, of Ft. Thomas, and Dr. J. J. Kay, of Frankfort, also supplied the members with some very valuable data during their discussion of the paper.

Dr. J. F. Shigley, of St. Paul, Minn., read one of the most interesting papers ever read before this Association, and one that created quite a little comment. His subject was "Glandular Therapy." Dr. E. Calldemeier, of Louisville, read a paper on "Eversion of the Uterus in the Cow", in which he outlined the technic of replacing the organ and the after-treatment. Dr. David Smith's paper on "A Veterinary Psycho-analysis" struck a responsive chord. His remarks were timely and to the point, with the original wit of Dr. Smith thrown in.

A business session followed, and the following were chosen as officers for 1923. Dr. H. Gieskemeyer, Newport, President; Dr. A. O. Longnecker, Hickman, 1st Vice-President; Dr. Geo. W. Pedigo, Glasgow, 2nd Vice-President; Dr. E. C. Higdon, Madisonville, 3rd Vice-President; Dr. J. A. Winkler was again chosen to serve as Secretary and Treasurer.

The second day was spent at the hospital of Drs. Miller and Calldemeier. Those who had not had the privilege of visiting this hospital prior to the meeting were struck with awe at the largeness and the completeness of the institution. Without a doubt their hospital is the most complete veterinary institution in the South.

Dr. W. B. Craig, Dean of the Indiana Veterinary College, addressed the Association along the lines of general veterinary interest. His paper was on "Some Fundamental Principles of Surgery." He included all phases of the work, such as restraint, operative procedure, etc. His discussion of the veterinary situation as it exists today was indeed interesting to all.

The Association then turned their attention to the clinics. Dr. W. B. Craig performed several operations on dogs, including ovariectomy. He also performed the "nicking" operation on several horses. His work was thoroughly enjoyed and his ability to lecture while operating was commented upon. Dr. J. W. Jame-

son, of Paris, also "set" several tails with the "nicking" operation. He also performed oophorectomy on two heifers. Dr. Jameson is getting along in years, but his ability as a surgeon has never been questioned.

Dr. D. Smith, of Shepardsville, performed the "button hook" method of spaying a bitch. Dr. C. N. Finch, of Jeffersonville, Ind., having just returned from Cuba, where he performed quite a few roaring operations on racers, arrived at the meeting in time to demonstrate the operation. The Association is always pleased to have Dr. Finch visit them as they enjoy seeing him operate.

We were then invited to partake of a buffet luncheon, served by Mrs. Calldemeier, Mrs. Miller and Mrs. Westmoreland, at the Hospital. Everyone thoroughly enjoyed the "eats". We were entertained during luncheon by the famous Louisville Jug Band of colored musicians. A vote of thanks was tendered the wives of the doctors who so kindly arranged the luncheon. A vote of thanks was also tendered Drs. W. B. Craig and C. N. Finch for their coming to the meeting. They both stated that the social features of the Kentucky meetings were surpassed by none. Both were invited to attend our summer meeting, which is to be held at Lebanon, Ky., on July 11th and 12th. This brought one of the most largely attended and most interesting winter meetings to a close.

J. A. WINKLER, *Secretary-Treasurer.*

MISSOURI VALLEY VETERINARY ASSOCIATION

The twenty-ninth mid-year meeting of the Missouri Valley Veterinary Association, held in St. Joseph, Mo., February 13-14-15, 1923, proved to be one of the best veterinary conventions held in the central West this season, and was considered by many old members one of the most successful meetings in the history of the Association. An attendance of approximately three hundred veterinarians who stayed until late into the last afternoon, taking in the splendid clinics, showed that the Association still holds the interest of the Missouri Valley veterinarians, in spite of the strong state meetings in the Missouri Valley, and regardless of legal difficulties.

Dr. H. B. Treman, of Rockwell City, Iowa, President of the Association, kept things moving all the time in his usual active style. Good discussions and an interest in the topics, followed each paper. The Secretary, Dr. R. F. Bourne, was taken sick en-route to the meeting, suffering from a hemorrhage of the stomach.

He may have to undergo an operation at the Mayo Hospital. His pleasant and helpful assistance at the meeting was indeed missed. Dr. Treman appointed Dr. E. R. Steel to act as Secretary during the convention.

An unusual procedure adopted by this Association proved to be highly successful. Due to the annoyance caused at former meetings, by some of the veterinarians lingering in the instrument-display rooms, the instrument people were requested to close shop during the programs. This they were very glad to do, for these men, themselves, wished to take in the program.

Another feature of the meeting was the manner of handling the clinic. Papers were read or talks made, and immediately following demonstrations were conducted. The large and comfortable amphitheater of the St. Joseph Veterinary College was greatly appreciated. The entertainment by the local committee, too, was certainly exceptionally fine. Several veterinary motion pictures were shown at night, and a dance given by the students was well attended. Community singing and solos by veterinarians also were attractions of the nocturnal proceedings.

The program included live topics by practitioners, papers and demonstrations from veterinarians with some of the Missouri Valley State Veterinary Colleges, and exhibits and discussions of pathological specimens by the B. A. I. veterinarians. Members who missed this meeting missed a very instructive, highly entertaining, and perfectly harmonious gathering of Missouri Valley veterinarians.

E. R. STEEL, *Acting Secretary.*

ALABAMA VETERINARY MEDICAL ASSOCIATION

The sixteenth annual meeting of the Alabama Veterinary Medical Association was called to order on the night of February 22, 1923, by the President, Dr. D. J. Meador. The meeting was held in one of the new Veterinary Buildings, of the College of Veterinary Medicine, of the Alabama Polytechnic Institute at Auburn. Dr. D. J. Meador delivered the President's address, in which he advised the veterinarians to enter into closer cooperation; support the State and Federal veterinary work, and also look after municipal and local interests of the veterinary profession. The key-note of his address was that veterinarians must organize and cooperate in order to obtain and maintain their rights in practice, in inspection work, and along all other lines.

In the absence of the writer, Dr. G. W. Browning, of Mobile, Ala., his paper, "Have Faith in Your Drugs," was read by the Secretary. This brought out some vigorous discussion, because the paper stated that a great deal depends on placing dependence in your drugs, and not so much attention should be paid to the new fads of bacterins, vaccines, etc. The next paper was read by Dr. J. H. Staples, on "Intestinal Parasites of Dogs." This was a well-written paper, giving the different classes of parasites, and enumerating and describing nearly all the species of intestinal parasites. In conclusion, he gave the common modes of treatment.

The next paper was read by Dr. L. K. Ogletree, of Enterprise, on "Fright Disease in Dogs." This brought out an extended discussion, especially covering the ground of causes and treatment. There were a number of suggestive causes, none of which were proven to be the real or combined cause of the disease. Among them were: a type of distemper, the toxic and irritating effects of intestinal worms, parasites in the nasal passages and sinuses of the head, constipation, botulinus poisoning, etc. As to treatment, there was nothing developed that was uniformly successful in its application. Also, it was the opinion that no type of dog was immune to this disease.

A general discussion on infectious abortion in cattle was led by Dr. W. B. Fleming. This discussion was confined largely to methods of handling the disease in a herd of cattle. It finally narrowed itself down to isolation, cleanliness of vulva, vagina and external parts; never breeding until the lochia had ceased; never adding any new female animals to the herd, except unbred heifers; regular and careful disinfection of the barns, etc.

The next thing in order was the post mortem, in the city and college slaughter house, on a grade Holstein heifer and calf. The cow had been made a suspect and held over a period of 60 days before the second test. She did not react to the intradermal and ophthalmic tests, and no lesions were found on post-mortem examination.

Dr. J. S. Andrade, of Huntsville, read a paper on rabies, covering largely the symptoms, causes and prevention. Dr. J. L. Orr then delivered a technical paper on toxin and antitoxin. He gave a list of disease-producing germs that produce toxins, the methods of producing antitoxins and their application and uses in the various diseases in which they are found.

Dr. R. S. Sugg, bacteriologist in the Veterinary College, gave

an interesting talk on the methods of preparing specimens to be sent to the laboratory for examination. He divided the specimens in four classes; (1) bacteriologic, (2) parasitic, (3) pathological, and (4) chemical. In other words, specimens sent to the laboratory are usually for one of these four kinds of examinations, and should be prepared specifically for a definite purpose.

Vaccines and bacterins were carefully discussed in a paper by Dr. J. W. Berry. His subject was somewhat technical and led to some discussion.

Dr. H. C. Wilson, Federal hog cholera specialist in Alabama, gave a talk on the present status of hog diseases in Alabama. He covered the subject of hog cholera, skin diseases, parasites, etc. He discussed the uses and abuses of hog cholera serum and virus. "Methods of Administering Drugs to Swine," was covered in detail by Dr. W. B. Castleberry. The various kinds of medicine and the modes of administration to the hog were described in full. How to handle hogs before and after giving the double treatment was described by Dr. W. B. Staples.

The next paper was read by Dr. I. S. McAdory, on "Handling and Care of Hospital Cases." He went into details as to the care of different kinds of hospital animals, stating that it was very essential that the animals in the hospital receive the best of attention and care in order to get the best results from surgical operations and internal diseases. The next paper was read by a Cuban, C. Cuadras, on tuberculin-testing of chickens. He described the intradermal test and the method of using it in chickens, and stated that the ophthalmic and subcutaneous methods were not applicable to poultry.

One of the most enjoyable features of the meeting was a banquet given by the students' Veterinary Medical Association. This banquet was spread in one of the new buildings of the Veterinary Medical College, and was attended by a hundred or more, at which the flow of reason, as well as the physical feast, was most heartily enjoyed by all who attended. The newly elected officers of the Association are; Dr. L. K. Ogletree, of Enterprise, President; Dr. W. S. Seibold, Gunterville, Ala., Vice-President; Dr. C. A. Cary, Auburn, Ala., Secretary-Treasurer.

On the morning of February 24th, the Federal and State authorities gave an examination to the senior students and the veterinarians. It covered the requirements for testing accredited herds. This was taken by about twenty persons. Also, on the morning of the 24th, there was a poly-clinic given at the surgical

and clinical departments. Among the cases operated on, and examined and diagnosed were: (1) an abscess of the shoulder; (2) strangles abscess in the posterior pharyngeal region; (3) strangulated hernia in a mule colt, in which the stitches were to be removed after a perfect cure had been made; (4) fistulous tract from deep abscess in the right ramus of the lower jaw of a mare. This was a sequel of the repulsion of a tooth at a previous period. There were a number of minor cases, such as spaying, that were handled at the clinic.

Dr. N. G. Covington gave a thorough demonstration of a post mortem on a mule. This involved every step, in which every part of the body of the mule was exposed for post mortem, or for naked-eye examination of pathological changes. It was the most complete autopsy ever witnessed by the veterinarians present. Dr. F. B. Paterson then gave demonstrations on methods of handling post mortems on chickens. This was a thorough and complete post mortem, showing all parts of the various organs, and division of the body in order that pathological changes might be observed by the naked eye. Since poultry-raising is coming into its own, it is extremely important that the practitioners cover every detail of autopsy work.

The committee on resolutions, reported the following resolutions for adoption:

1. We hereby take this occasion to extend our sincere thanks and commendations to President Spright Dowell and the Board of Trustees, of the A. P. I., for the new buildings and equipment, and support of the College of Veterinary Medicine, of the A. P. I., and suggest that the College be further supported by other necessary buildings and equipment.

2. That no graduate or licensed veterinarian shall be permitted to accept the position of County Veterinarian, or County Demonstration Agent, or both, in the State of Alabama.

3. It is the consensus of opinion of the Alabama Veterinary Medical Association, in convention at Auburn, Alabama, February 23, 1923, that all meat and milk inspectors shall have a veterinary medical license from the Board of Veterinary Medical Examiners of the State of Alabama, and that all meat and milk inspection in Alabama should be under the supervision of licensed veterinarians.

C. A. CARY, *Secretary.*

THE NORTHWESTERN OHIO VETERINARY MEDICAL ASSOCIATION

The sixteenth annual meeting of the Northwestern Ohio Veterinary Medical Association was held in the Hotel Waldorf, Toledo, Ohio, on Wednesday, February 28, 1923, President C. E. Inskeep presiding. The meeting was called to order at 11:45 a. m. The Treasurer's report was read and accepted.

Four new members were added to our list, making a total membership of 115.

The following officers were elected for the ensuing year: President, Dr. H. E. Ash, Bowling Green; Vice-President, Dr. W. F. Wise, Medina; Secretary-Treasurer, Dr. C. A. Fast, Van Wert. Dr. F. A. Lambert moved that a vote of thanks be extended to the retiring officers for their devotion to the interests of the Association, which motion was unanimously carried. It was decided that the next meeting be held at Russels Point. No definite time was specified, but it would be sometime in August. Immediately following the business session, a banquet at the Waldorf was enjoyed by all.

The afternoon session was opened by Dr. E. W. Porter, Assistant Pathologist, at the State Serum Plant, Reynoldsburg, Ohio. It was felt that his talk and charts alone were worth more than the business missed at home. The discussion was led by Dr. C. W. Fogle. The second number on the program was an excellent paper, entitled "The Relation of the Field Veterinarian to the Practitioner," by Dr. Leo E. Davis, who is in charge of cooperative work for the B. A. I. Dr. Reuben N. Hilty led the discussion on this paper. The next paper, "The Practical Value of Poultry Vaccines," by Dr. E. D. Ensign, of Bryan, was brief but to the point. It was followed by very free discussion. Dr. G. L. Freeze gave a splendid talk on "Everyday Diseases of Dogs," which aroused a very general discussion.

We were honored with the presence of some Michigan visitors, among them being Drs. A. L. Tiffany, of Monroe, H. T. Carpenter, of Detroit, and H. Preston Hoskins, Secretary-Editor of the A. V. M. A., of Detroit. These men were not wall-flowers either, because they took an active part in the discussions. Dr. Carpenter, as President of the Southeastern Michigan Veterinary Medical Association, invited his Ohio neighbors to the next meeting which will be held in Detroit, April 11th. Dr. Hoskins gave the final address of the meeting. His talk was in behalf of the A. V. M. A., and he was able to give some advance information concerning the Montreal meeting. He concluded his remarks with an invitation for all veterinarians to attend the Montreal meeting and enjoy themselves in a way that was impossible in the States.

CHARLES A. FAST, *Secretary.*

VETERINARY CONFERENCE AT THE UNIVERSITY OF PENNSYLVANIA

The annual Veterinary Conference at the University of Pennsylvania, held on February 27th and 28th, was very successful and well attended. Over 150 veterinarians registered mostly from Pennsylvania, but many from adjoining states (N. J., N. Y., Del., Md., R. I.)

"Demonstration of the Regional Anatomy of the Chicken," by Drs. W. J. Lentz and E. T. Booth, was the first subject of the opening session. The title is misleading because in the dozen or more birds dissected one learned, besides the anatomy, much of the physiology of ovulation, digestion and respiration. The discussion of the specimens of Dr. Lentz was very instructive and paved the way for the presentation of the papers following.

Dr. Fred Boerner, Jr., of the Pennsylvania Bureau of Animal Industry, spoke on "Chicken Pox and Related Diseases." His remarks were illustrated by lantern slides from which the differential diagnosis was made clear. His experience with vaccines in chicken pox on 2197 cases and 3274 controls led him to conclude that vaccines were useless.

In discussing this paper Dr. A. D. Goldhaft, of Vineland, N. J., said chicken pox is not feared by poultry husbandmen when pullets are on range, because then the mortality is low, and that some introduce the disease at that time so that an immunity may be acquired which will protect them when housed and laying. He also said, in speaking of bacillary white diarrhoea, that many flocks in New England were advertised as "accredited-free" from the disease; that their eggs for hatching and birds are safe to introduce into other flocks.

Dr. E. L. Stubbs, of the Pennsylvania Bureau of Animal Industry, spoke on Avian Tuberculosis. He said the abdominal lesions predominate in the following order: first the liver, then the spleen and lastly the intestines. The diagnosis is made by autopsy on individuals and by the intradermal test of flocks. Dr. Stubbs had a demonstration showing several birds with a pronounced reaction to the test. The injection is made in the wattle.

In the afternoon, Dr. F. S. Jones, of the Department of Animal Pathology, Rockefeller Institute for Medical Research, presented "Pneumonia in a Dairy Herd Attributed to *Bacillus Bovisepticus*." In this outbreak, Dr. Jones pointed out that

post mortem he found the spleen and kidneys sterile, but the organisms were found in the lungs, from which he concluded that all pneumonias of cattle are not hemorrhagic septicemia as is usually thought. The paper was well discussed by Dr. Joseph Johnson, of Lancaster, Pa., and others. As usual, the value of vaccines in hemorrhagic septicemia was debated. Dr. Johnson said he had used vaccines in 2000 cases and believed them beneficial.

Following this paper, Dr. Ralph B. Little, a colleague of Dr. Jones, delivered a paper on "The Significance of Colostrum to the New-born Calf, Cow Serum as a Substitute, and Absorption of *B. Abortus* Agglutinins from Colostrum and Cow Serum." This was a review of three papers on closely related subjects. It was accompanied by lantern slides from his experiments, from which Dr. Little deducted that colostrum contains agglutinins and that the lack of colostrum causes intestinal bacteria to become pathogenic during the early days that are harmless later on. These protective agents are also present in the cow serum which if given *per os* or intravenously replaces the colostrum. The new-born calf, given these protective properties soon after birth, thrives better than one deprived of them.

Dr. Hugh F. Dailey, Chief Veterinarian, Angell Memorial Animal Hospital, of Boston, Mass., gave an interesting paper on "Coli-Bacillosis of the Cat." This disease, which too frequently affects cats entered in hospitals for minor ailments or operations, is not an infectious disease primarily, but an intestinal stasis progressing to a toxemia, according to Dr. Dailey. If taken early it is not to be feared. Prevention is important. This consists of an enema of normal salt solution to empty the rectum (it also causes urination in most cases). Following this two drams of castor oil is given. He cautioned against carrying or handling the patient after administering castor oil, as vomition is often produced by so doing. Should this occur, repeat until it is retained.

In the evening, Dr. Allen J. Smith, of the Medical School, University of Pennsylvania, gave an interesting talk on "Inflammation as a Defensive Reaction," in his usual interesting and impressive style. Although an old subject, and Dr. Smith said he had nothing new to offer, so attentive was the big audience throughout the hour that one could have heard a pin drop at any time.

On Wednesday morning, the session was opened by Dr. Edw.

A. Cahill, Director, Pitman-Moore Laboratories, with a comprehensive survey of "The Diseases of Swine." With the limited time at his disposal, Dr. Cahill touched upon all the important diseases of swine in a remarkably able manner. I will summarize here only a few of the points he brought out.

1. Hog cholera is the most serious disease of swine.
2. Hog cholera vaccination is as valuable as ever.
3. Hog cholera should always be suspected unless previously protected.
4. Baby-pig vaccination should be avoided or followed up later.
5. Other diseases are widespread and serious and the lesions found in hog cholera are frequently found in them.
6. Healthy swine harbor pulmonary infectious germs.
7. The profession is negligent in not making accurate diagnosis.
8. Parasitic diseases are increasing. They devitalize the system and predispose to other maladies.
9. "Flu" as an entity is disputed; it is probably a form of hemorrhagic septicemia. Mortality 2-3%. Loss in weight is the worst factor.
10. Swine erysipelas does exist in the Western States although it is generally believed that the U. S. is free from it.
11. Hog cholera travels in cycles of 7 years. This is true in hemorrhagic septicemia and necrotic enteritis, but not so well defined.

Dr. B. H. Ransom, Chief, Zoology Division, U. S. Bureau of Animal Industry, with the aid of lantern slides, gave an interesting talk on "Ascaris in Swine." This is a much neglected but highly important phase of swine husbandry. Dr. Ransom showed how eggs pass through the intestinal walls to the liver, heart and lungs, in from 18 to 24 hours after ingestion. The old belief that the rat was a necessary intermediate host was clearly disproven. The new-born pig is most susceptible and a tremendous loss through death and stunted growth is sustained throughout the country, from this parasite alone. In explaining how resistant the eggs of this worm are, Dr. Ransom stated that they grow them in the laboratory in 2% formalin solution. For prevention, the following rules should be observed:

1. Have clean farrowing pens.
2. Clean sow—dirt washed off.
3. Move within two weeks to clean pasture.
4. Keep pigs on pasture for four months.
5. Proper food, water and shelter from sun and rain.

In the afternoon, we were entertained by the Provost of the University, Dr. Josiah H. Penniman. Owing to unavoidable circumstances he was unable to deliver his address earlier, but made up for the delay by the sincerity of his welcome. Dr. Penniman pointed out the serious situation of veterinary education at the present time, the decrease in schools and enrollment. "Since the health and well-being of a community rests so largely in the hands of veterinarians, the University of Pennsylvania is proud of having a school training men along these lines." He suggested going to the high schools and getting young men thinking about the source of their food and clothing, about milk and meat hygiene, and of the need for veterinarians to protect these resources, a work worthy of their best intelligence and effort.

Dr. H. C. Crawford, of Jamaica, L. I., presented a comprehensive paper on "Some Ailments Peculiar to the Thoroughbred and Hunter." His subject was large and ably handled. Although the diseases mentioned were familiar to veterinarians, it was very interesting to have pointed out to us how peculiarly susceptible these two types of horses are to the ailments affecting especially the extremities. The paper was fully discussed by Dr. Adams in his usual interesting manner.

The final paper of the program was a "Discussion of the Factors Concerned in the Etiology of Equine Influenza and Contagious Pneumonia," by Captain R. A. Kelser, Veterinary Corps, U. S. Army. Dr. Kelser has had considerable experience as a laboratory man and in the field during and since the late war. He said that there was nothing new known about the specific etiological factors responsible for these two diseases. He strongly emphasized the predisposing causes and the prime importance of eliminating them insofar as possible. This is paramount even if deeper research reveals more clearly the identity of the specific causative agents. Data collected by the War Department was cited, by which he showed how the incidence of these two diseases had been stupendously reduced through the exercise of vigilant supervision and enforcement of sanitary police measures.

Although Capt. Kelser confined his remarks to the two diseases mentioned, one could not help but feel that such measures might with equal propriety be directed against a large number of our epizootics instead of relying entirely upon some biological agent, a method which is unfair both to the patients and to the biological product.

V. G. KIMBALL, *Recorder*.

ARIZONA VETERINARY MEDICAL ASSOCIATION

The regular annual meeting of the Arizona Veterinary Medical Association was held at Glendale, Ariz., February 24, 1923. The meeting convened at the hospital of Dr. Emmett Otto, and was very well attended. The extensive program included a surgical clinic in the afternoon. Among the subjects discussed were "Tuberculosis Eradication," by Dr. M. Shipley; "Veterinary Legislation," by Dr. Dotty; "Forage Poisoning in Horses," by Dr. C. H. Newton; "Some Experiences of a State Veterinarian," by Dr. R. J. Hight; "Experiences of a Veterinarian at Port of Entry," by Capt. D. B. Leininger; and a number of others. The clinical part of the program included "Animal Restraint," by Dr. Emmett Otto; "Fistula Operation," by Dr. S. E. Douglas; "Veterinary Dentistry," by Dr. H. E. Gerdes; and "Lameness of Horses," by Dr. Z. S. McNees.

Before the invention of the microscope the mite was the smallest known animal. It had a volume less than a cubic millimeter. It is now proved that a cubic millimeter of rottenstone is composed of more than 2,000,000 shells of fossil animals. One drop of pure water may contain about 150,000,000,000 infusoria.—*Science*.

First Artist: "I painted up a lump of pig-iron once to look like cork, and when I threw it into the water it floated."

Second Artist: "That's nothing! I painted a lump of pig-iron to look like a roast of beef, and my dog ate three-quarters of it before he discovered his mistake."—*Boston Transcript*.

One of the questions in an examination on the subject of stock-raising was, "Name four different kinds of sheep."

An aspiring youth gave this for the answer, "Black sheep, white sheep, Mary's little lamb, and the hydraulic ram."—*Eastern Oracle*.

COMMUNICATIONS

CONCERNING REVISION OF CONSTITUTION

TO THE EDITOR:

The first recommendation contained in paragraph five of the Report of the Special Committee on Closer Affiliation with State and Provincial Associations (Journ. A.V.M.A., Oct. 1922, p. 100) reads as follows: "Therefore we recommend that a special committee, consisting of the President of the Association and four other members, be immediately appointed to study the details of the plans herewith submitted, in conjunction with the Executive Board, and that this report shall be considered as a written notice to the Association of a proposed revision of the Constitution and By-Laws at the next annual meeting."

The Report was adopted and the recommendation quoted above automatically became in force. In view of this fact and that the Special Committee is doubtless proceeding now on that basis, it is important that the attention of the members of the Association be drawn to two facts in connection therewith.

(1) What were "the plans herewith submitted?" There is nothing in the Report or in the Proceedings which even hints at the nature of these plans. No wonder Dr. Torrance made the remark "The report of this committee being as brief as it is, it is difficult to understand it!" In answer to Dr. Torrance's request for information as to these plans he was informed that the findings of the Committee and the Board would be published "prior to the next annual meeting when it is up for *adoption*." Fortunately there are several things which the Association may do about these findings other than adopting them or any part thereof.

(2) The second point is much more important than the preceding one, since it involves a proposed action which is clearly in contravention of Article VI of the Constitution of the Association. The action referred to here is "that this report shall be considered as a written notice to the Association of a proposed revision of the Constitution and By-Laws at the next annual meeting." Anyone who will read Article VI will see at once that this violates in two respects the specific, and therefore the only way, in which amendments may lawfully be made. First, the notice will not have been made in writing "at an annual meeting," and

second, it is proposed to violate the provision that "such amendments shall not be acted upon until the next following annual meeting." I therefore protest emphatically against this proposed double violation of the Constitution, and express the hope that, if an attempt is made at the Montreal meeting to 'put it over,' it will meet another Verdun, this time on the soil of New France.

There is no intention here to discuss the merits or demerits of the present Constitution and By-Laws, on which something may be said later. May I suggest that we try, for a change, to live up to them as they are, as well as to the Rules of Order? I commend this idea especially to the officers and the Executive Board.

Yours very truly,

S. Sisson.

Columbus, Ohio, March 10, 1923.

HOG CHOLERA CELEBRATES

1923 is the 90th Anniversary of the appearance of hog cholera in the United States. Probably there are many people who will wonder why this unfortunate event should be commemorated, for like being poor, it is nothing to sit on the back fence and boast about. However, the fact that a preventable disease should hold sway for 90 years causing losses that total from 30 to 75 millions of dollars annually is a matter that deserves more than passing notice.

In the fourscore and ten years that the disease has been in existence in the United States every conceivable method has been tried for combatting it. This includes home remedies, quack preparations, proprietary compounds, and even the wonderful anti-hog cholera serum which has been in use for 15 years. Yet hog cholera is still one of the most serious animal diseases with which we have to contend today.

It is undoubtedly high time that the malady be attacked from another angle, and it is apparent that the 90th Anniversary of this dread disease in this country could be commemorated in a most fitting manner by the formulation of concrete plans to get rid of the scourge.

Hog cholera is in reality a self-eradicating disease. When denied new fuel, and this is easy to accomplish, it rapidly burns itself out, and only in exceptional instances is the infection harbored for any great length of time on premises. If the infection is not reintroduced into these localities, it is patent that they

will remain free from the disease. Therefore, it is obvious that steps must be taken to correct the practices whereby the infection is introduced into free territory.

In some localities the feeding of garbage, table refuse or kitchen swill containing bones, rinds or scraps of pork is the principal source of new outbreaks. In other districts, the introduction of sick or exposed hogs is mainly responsible for starting new centers of infection. Then again, in some places, by the abuse of the double treatment, new outbreaks are not only started, but centers of infection maintained. These are the factors responsible for practically all if not every new outbreak.

These three factors are inconsistent with sanitation and must be controlled if the disease is to be eliminated. It is feasible to control any or all of them. Either this will be done or in 1923 some one will be writing a sketch regarding the 190th Anniversary of the disease in the United States.

I. K. ATHERTON,

Inspector in Charge of

College Park, Md., March 14, 1923.

Hog Cholera Work.

POSITION WANTED

TO THE EDITOR:

I have recently had a communication from a veterinarian in Austria who is desirous of obtaining a position as Assistant Professor in Pharmacology or assisting in general practice. He is unmarried and had had seven years experience in city and country practice. He has done scientific work in a vaccine laboratory and is a contributor to veterinary Journals. He has also studied or investigated paratyphus, Texas fever, acetoneemia of cattle, acidosis of swine, lamiektie, encephalitis lethargica, louping ill of sheep, botulism, etc.

He would expect a "living wage" and as opportunities and proficiency develop, would desire a corresponding increase in order to save something. In addition to his native tongue, he knows French and has a fair knowledge of English.

I will be glad to put any one interested in direct communication with this veterinarian.

Very truly yours,

PIERRE A. FISH.

Ithaca, N. Y., March 20, 1923.

FROM ILLINOIS

A letter was recently received from a County Farm Bureau, in the State of Illinois. We had knowledge of the fact that the farm adviser connected with this particular Farm Bureau had been making himself obnoxious to and had been making considerable trouble for the veterinarians in his county. If this letter is a sample of the scientific emanations from this particular Farm Bureau, we do not wonder why veterinarians so frequently complain about the activities of these farm advisers. Needless to say, the request contained in the letter was declined, and the 50c in stamps returned. The letter follows:

"Dear Sirs:

Enclosed find 50c in stamps for which please send me book No. 61, 1922 in which is described the details for the administration of an interputation of results in the subcutaneous intradermal and ophthalmic tuberculin tests alone and in double and triple combination.

Thanking you in advance for your information, I am

Most sincerely yours,"

BAD

Hawaii? Are you Hungary?

Yes Siam.

Come on, I'll Fiji.

WORSE

Electrician's Wife: "Watt's the meter? Wire you insulate?"

Electrician: "I got shocked by a couple o' vamperes."—
'Ee-'Aw.

WORST

Man (in drug store): "I want some consecrated lye."

Druggist: "You mean concentrated lye."

Man: "It does nutmeg any difference. That's what I camphor. What does it sulphur?"

Druggist: "Fifteen scents. I never cinnamon with so much wit."

Man: "Well, I should myrrh, myrrh! Yet I ammonia novice at it."—*Handy Hanson.*

When an old negro of Joplin complained he had lost his dog, his employer asked why he didn't advertise for the animal.

"Dat wouldn't do no good," returned the old man. "Dat dog kain't read."—*American Messenger.*

MISCELLANEOUS

A REMARKABLE HEN

Through the kindness of Dr. L. I. Hines, of Spencer, Nebraska, we have received an account of a most remarkable hen, and the equally remarkable record she made during 1922. This wonderful bird, Katrina by name, holds forth at 307 Twelfth St., Crete, Nebraska. She began laying January 10, 1922, and in eighteen days had fifteen eggs to her credit. January 29th, she decided to hatch some chicks, and on February 19th brought forth a family of fourteen from fifteen eggs. She raised all of these, and at last reports, every one of the fourteen was laying.

Katrina started laying again April 4th, laying fourteen eggs in nineteen days, then decided to set again, and brought forth the second brood of fourteen fine chicks on May 14th. At this point trouble began. Evidently some of the other hens in the flock became very jealous of Katrina, and in regular female fashion, attacked Katrina, inflicting serious bodily damages. In fact, she was so seriously incapacitated, that the wife of the owner of Katrina advised the hatchet, but this treatment was not applied, when Katrina's former record was considered. Her owner administered to her wounds so well that she made a complete recovery, and on July 15th, started on her third hatch, this time producing sixteen eggs in twenty days, and by August 22nd, was clucking to a third brood of thirteen chicks. While raising these, she spent the time economically in moulting, and began laying again Oct. 10th. After laying eighteen eggs, she decided to finish up her 1922 record, by bringing forth the largest brood of all, which event occurred on December 22nd, when seventeen fine, healthy chicks made their appearance.

Katrina is now characterized as the "8½-pound, champion, White Rock, combined egg-producer and incubator." Records show that Katrina laid sixty-four eggs, hatched fifty-eight, and raised them all. From a financial standpoint, the value of her output for 1922 was \$35.25, not including the eggs laid by the pullets of the first brood.

For polishing nickel that has become discolored, a paste of talc or clay with diluted sulphuric acid answers better than many prepared polishes.

NECROLOGY

CHARLES M. ANDERSON

Dr. Charles M. Anderson, of North Portland, Oregon, died during the month of January, of heart disease. Dr. Anderson was born January 6, 1888, at Council Bluffs, Iowa. He graduated from the San Francisco Veterinary College in the year 1918, and joined the American Veterinary Medical Association in 1919. For a while he held the position of assistant in the laboratory of the United States Public Health Service, at San Francisco. Dr. Anderson was a member of the Oregon State Veterinary Medical Association.

MRS. J. F. BARNES

Mrs. Flora Lucretia Barnes, wife of Dr. J. F. Barnes, of Toledo, Ohio, passed away at her home, 715 Broadway, on January 28, 1923. Mrs. Barnes had been in poor health for some time, but the immediate cause of her death was hemorrhage of the brain.

Mrs. Barnes was born in Dunkirk, Ohio, November 19, 1858. She attended a number of the meetings of the American Veterinary Medical Association, with Dr. Barnes, the last being the meeting in New York City, in 1913. The body was laid to rest January 31, 1923, in the mausoleum on the City Boulevard, in Toledo.

JOSEPH M. SOMMERS

Mr. Joseph M. Sommers died suddenly at his home in Detroit, Michigan, on March 5, 1923, at the age of 54 years. Mr. Sommers had been in the employ of the Bureau of Animal Industry for over 26 years, having entered the service as a tagger, October 1, 1896. He was first assigned to Milwaukee, and on June 1, 1901, was transferred to Detroit. He successively held the positions of stock examiner, foreman of taggers, inspector's assistant, and in 1914 became a lay inspector, grade 2, under the reclassification. Veterinarians who have been members of the Detroit force in past years, will remember Mr. Sommers as a valuable and highly respected government employe.

DR. WILLIAM J. MILKS

Dr. William J. Milks, father of Dr. Howard J. Milks, of the New York State Veterinary College of Cornell University, died February 26, 1923, at his home in Johnson City, N. Y. He had been in poor health for sometime, and had been confined to his bed for about three weeks. Dr. Milks spent most of his professional life at Candor, N. Y.

MRS. JOHN T. GRUBER

Mrs. Marguerite G. Gruber, wife of Dr. John T. Gruber, died March 24, 1923, at the home, No. 871 Mt. Vernon Avenue, Marion, Ohio. She had been ill for over two years, and death was due to heart trouble. Mrs. Gruber was born in Pittsburgh, Pa., June 3, 1884, and had been a resident of Marion for 13 years. Funeral services were held March 26th.

As we are closing the forms for this number of the JOURNAL, we are in receipt of information indicating the deaths of the following veterinarians: Drs. Roy Smith, of Eugene, Oregon; John Montgomery, of Anamosa, Iowa; and H. T. McNeal, of Sunbury, Pa. We hope to be able to publish the details in the May JOURNAL.

PERSONAL

Lt. E. M. Curley (U. P. '11) is stationed at Fort Des Moines, Iowa.

Dr. S. H. Gilliland (U. P. '01) is reported to be sojourning in the south

Dr. E. O. Smith (Chi. '18) has removed from Carlock, Ill., to Princeville, Ill.

Dr. A. J. Clark (San F. '15) has removed from Chillicothe, Mo., to Sioux City, Iowa.

Dr. A. G. G. Richardson (U. P. '94) is President of the Georgia State Veterinary Association.

Dr. Augustus Berdan (N. Y.-Amer. '03) has been transferred from Seattle, Wash., to Pembina, N. Dak.

Dr. W. A. Young (Iowa '19) is now located in Des Moines, Iowa, having removed from Cherokee, Iowa.

Dr. John R. Möhler (U. P. '95) attended the recent convention of the Southern Cattlemen's Association.

Dr. C. J. Marshall (U. P. '94) was recently elected a Trustee of Messiah Universalist Home of Philadelphia.

Dr. W. J. Chynoweth (Corn. '19) is associated in practice with Dr. W. G. Hollingworth (Amer.), 411 Broadway, Utica, N. Y.

Dr. Werner Runge (Berl. '79) is chief of the Veterinary Bureau of the Department of Health for the City of Newark, N. J.

Dr. A. D. Goldhaft (U. P. '10) of Vineland, N. J., is planning the erection of a small animal hospital along strictly modern lines.

Dr. C. V. Noback (Corn. '11), who recently returned from South America, is now engaged in graduate work at Cornell University.

Dr. F. S. Ballard (Iowa '11) is now located at Ashton, Iowa. In a note to the Editor, he writes: "The first number (March) is O. K."

Dr. F. J. McNeal (Ont. '95) of Wilkes-Barre, Pa., in sending his check for dues, writes: "I would not want to be without the JOURNAL."

Dr. S. Brenton (Ont.), of Detroit, Mich., was recently called to Lansing to attend a meeting of the Bovine Tuberculosis Eradication Committee.

Dr. S. A. Goldberg (Corn. '14) recently addressed the Tompkins County (N. Y.) Medical Society on "The Pathology of Deforming Arthritis."

Dr. J. N. Frost (Corn. '07) was a recent visitor at the University of Pennsylvania School of Veterinary Medicine, while enroute to Madison, N. J.

Hon. L. Whitney Watkins, of Manchester, Mich., has been appointed Commissioner of Agriculture of the State of Michigan, succeeding Hon. J. A. Doelle.

Dr. W. J. Lentz (U. P. '04), addressed the Chester County Veterinary Club, at West Chester, Pa., on February 8th, on the subject of "Small Animal Diseases."

Dr. H. T. Ludwig (O. S. U.) has been transferred from Detroit, Michigan, and is now located in Louisville, Ky. He gives his address as 1114 South 4th Street.

Dr. Frank K. Hanson (K. S. A. C. '19) has been placed in charge of disease-control work, for the Department of Agriculture, in the upper peninsula of Michigan.

Dr. Henry W. Turner (U. P. '93) addressed the regular meeting of the Conestoga Veterinary Club, in February, on the subject of "Preventive Medicine."

Dr. V. A. Moore has been appointed a member of the Advisory Council of the New York Health and Tuberculosis Demonstrations of the Milbank Memorial Fund.

Drs. J. G. Wills (Corn. '06) and J. C. Miller, of Albany, N. Y., were in Ithaca during "Farmers Week", February 12-17, held by the New York State College of Agriculture.

Dr. Ward Giltner (Corn. '06) is now a radio expert. He recently broadcasted from a station connected with one of the Detroit newspapers on the subject of "Bacteriology."

Dr. Russell A. Runnells (Mich. '16), of East Lansing, Mich., is again planning to spend a part of the summer in post-graduate work in pathology, at the University of Michigan.

Dr. John H. Winstanley (U. P. '10), recently addressed the students in vocational training at the Mansfield (Pa.) Normal School on the subject of "Diseases Affecting Farm Animals."

Dr. A. Stanley Schlingman (O. S. U. '11) has accepted a position with Parke, Davis and Company, as veterinary pathologist and bacteriologist in the Medical Research Laboratories.

Dr. Chas. H. Kitselman (U. P. '18), of the Department of Pathology, K. S. A. C., writes: "Couldn't get along without the A. V. M. A. JOURNAL. Best wishes for its continued success."

Dr. P. A. Fish (Corn. '99), the first editor of the JOURNAL after it was taken over by the Association, writes: "Your initial number was fully up to standard as to contents and mechanics."

Dr. H. C. H. Kernkamp (O. S. U. '14), is taking work in the Department of Pathology, in addition to his regular duties as a member of the Faculty of the Department of Agriculture, University of Minnesota.

Dr. Louis A. Klein (U. P. '97) attended a meeting of the committee on revising the regulations governing production of certified milk, appointed by the Association of Medical Milk Commissions, February 23-24.

The many friends of Dr. J. G. Rutherford (Ont. '79) will regret to learn of his serious illness. Dr. Rutherford was compelled to seek the temperate climate of a Pacific Coast resort, about the middle of February.

Dr. P. A. Fish (Corn. '99) and Dr. C. E. Hayden (Corn. '14) attended the meeting of the Western New York Branch of the Society for Experimental Medicine and Biology, held in Syracuse, N. Y., on February 17th.

The American Journal of Obstetrics and Gynecology, for November, 1922, contained an article by Dr. W. L. Williams, entitled, "Some Phases of Bovine Genital Infections of Possible Interest to the Medical Profession."

Dr. Earl Sunderville (Corn. '08), of the Cornell faculty, is on leave for the present term. He expects to spend part of the time visiting other veterinary schools, and will also spend some time in study at Cornell University.

Dr. L. W. Carl, of Columbus, Ohio, has tendered his resignation as a member of the A. V. M. A. Dr. Carl is now District Manager of the Mutual Life of New York, with offices in the First National Bank Building, Columbus, Ohio.

Dr. G. A. Johnson (Iowa), of Kansas City, Kans., has returned from a trip to Florida, occasioned by the illness of his father. The latter is reported to have made a very satisfactory recovery. Mrs. Johnson remained in Florida until early in March.

Dr. George Ticehurst, of Adams Center, N. Y., and Dr. M. L. Hannahs (U. P. '16), of Watertown, N. Y., have entered into a partnership under the firm name of Ticehurst and Hannahs, and are devoting particular attention to the diseases of cattle.

Dr. S. E. Douglas, of Mesa, Ariz., succeeded Dr. R. J. Hight (Chi. '07) as State Veterinarian of Arizona, on February 1st. Dr. Hight served as State Veterinarian for four years. Dr. Douglas is Secretary of the Arizona Veterinary Medical Association.

Dr. Carl W. Gay (Corn. '99), of Ohio State University, addressed the annual meeting of the Eastern States Guernsey Club, which was held at the Hotel Adelphi, Philadelphia, Pa., February 9, 1923. The subject of his address was "Some Fundamental Facts about Breeding Livestock."

Dr. Stephen Lockett (U. P. '06), who has been in the service of the Nevada Agriculture Experiment Station for a number of years has been appointed Government Veterinary Surgeon for the Island of Jamaica, and has gone to take charge of control work in connection with the outbreak of foot and mouth disease, which has been prevalent on that Island for several months.

Among the veterinarians who attended the Agricultural Conference called by Governor Pinchot, at Harrisburg, Pa., on February 20th and 21st, 1923, were: Drs. M. F. Barnes (U. P. '11), H. R. Church (Ont. '92), G. A. Dick (U. P. '04), W. A. Haines (U. P. '07), H. N. Havner (Iowa '11), F. A. Marshall (Ind. '06), T. E. Munce (U. P. '04), J. N. Rosenberger (U. P. '10), and E. L. Stubbs (U. P. '11).

Dr. J. I. Gibson (Ont. '87), of South St. Joseph, Mo., writes that he was pleased with the March edition of the JOURNAL, and that he is planning to attend the meeting in Montreal. Dr. Gibson will also visit his mother, brothers and sisters, who live in Ottawa. Incidentally he mentioned the fact that Des Moines, "the best convention city in the West," will make another bid this year for the 1924 meeting of the A. V. M. A.

Veterinarians contributed liberally to the program of "Farmers Week," held by the New York State College of Agriculture, at Ithaca, February 12th to 17th. Dr. J. N. Frost (Corn. '07) participated in a round-table discussion dealing with poultry barn arrangement, construction and ventilation. Dr. H. J. Metzger led a discussion on "Tuberculosis." Dr. R. R. Birch (Corn. '12) spoke on "Abortion and Related Troubles." Dr. W. A. Hagan (Kan. '16) discussed "Internal Parasites of Poultry." Dr. J. W. Fuller took part in the discussion relating to "Poultry Diseases and Sanitation."

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No. 2

ALL IN THE DAY'S WORK

During the course of the past few months we have received a great many letters. Such is to be expected in a position such as ours. Most of these letters have been pleasant to receive. They have contained an occasional complaint, something not very serious and easily adjusted, now and then a grievance, just as often imaginary as real, once in a while a letter that causes us to stop and seriously take an account of stock, and every now and then a message that causes a genuine smile to creep across our usually serious mien. Then a letter that we put away, to be read again the next day—and perhaps again the next, because we are not sure that we have correctly interpreted what the writer wished to convey. We want to let it digest.

From time to time we will take our readers into our confidence and show the contents of some of these letters. One of these is before us right now. The writer had evidently been taking an account of stock, just as we are wont to do, when occasion demands. Here are some of the things this man wrote:

“Keep after us practitioners and give us H— along general morals, technique, ethics, and so on, for in very truth it is by the practitioner that the profession is known.

“As veterinarians, we certainly appreciate our college pro-

fessors, with their superior knowledge. Many times we appeal to them for advice in treatment or help in diagnosis. Yet we sometimes criticise the JOURNAL and say that it is becoming a scientist's paper, and that it is no longer of much use to us. This is unfair, for without our college reports and such like, we would not even have a paper at all.

"The average practitioner is either too busy, or he may not have the facilities to test out and report on cases as he would like to do. Instead of covering pages with a report of some very interesting case, he can put it all down in a very small space, and then, if it does not look right or worth while, he just doesn't send it at all.

"Now if you can make everybody feel at home—'Just come right on in and sit down by the fire'—why I am sure that our family will grow."

To which we rise and remark: We want more letters of this kind, and more members like the man who wrote it.

WOMEN'S AUXILIARY OF THE A. V. M. A.

Though the convention in Montreal is still some months off, the railroads are sending out data as to rates and accommodations, so it behooves those of us who are planning to go, to start saving our pennies for that event.

To those of you who did not go to St. Louis last year, let us say that you missed a fine meeting and a good time. So we suggest that you start now to educate the Doctor into thinking that this would be a wonderful vacation trip.

If there are any ladies in your County or State who are not members, ask them to come to the convention. They may become members, however, without attending the convention, although we would like to see them there.

Besides the pleasure of becoming acquainted with the wives of veterinarians the country over, we have the privilege of aiding worthy young men to complete their veterinary education, by paying our dues, which are \$1.00 per year. During the present college year we have loaned four hundred and fifty dollars, to such young men.

If you have not paid your dues, the Secretary, Mrs. F. A. Lambert, 1402 Fair Ave., Columbus, Ohio, will be pleased to receive them. Please *do it now*, along with your spring house-cleaning.

D. I. L.

FARMER VACCINATION SPREADING

Michigan is now among the states threatened with farmer vaccination. A bill that is worded very closely after the Iowa law has been introduced in the Michigan legislature, and at the time this is written, has been reported out of the House Committee on Agriculture, in spite of strenuous efforts to have the bill die a natural death, through failure to be reported out. The House Committee on Agriculture granted a hearing to the proponents and opponents of the bill, on April 4, and for eight days nothing was heard of it. On the 12th it was reported out, after having been amended in two particulars, both favorable to opponents of the measure.

At the hearing on the bill, several points were brought out by both sides, which may be of interest. Arguing for the bill, one prominent farmer and swine-breeder stated in very emphatic terms that as a tax-payer he was entitled to all the education he could get, and that any further instructions or information he could obtain, on the subject of hog cholera and the use of serum and virus, was in the line of education, to which he was justly entitled. (He omitted to mention that the federal Bureau of Animal Industry has had a veterinarian stationed in his particular county, for a number of years, engaged in hog cholera control work.)

The second point that this proponent of the bill brought out was that the farmer has been driven to practice the strictest economy possible, and that if he could do his own vaccinating he could lower the cost of pork production. There was no suggestion that the veterinarians in his territory had been profiteering in their charges for vaccination, and we have information to the effect that the County Farm Bureau has been purchasing most of the serum used in this County, at 70 cents per hundred. The only saving that this man could effect would be the veterinarian's fee for service, and most farmers who have done any of their own vaccinating will confess that there is very little economy in the end, if any at all. Farmers have only been "kidding" themselves in this regard, too many times.

One of the disquieting features of the hearing, so far as we were concerned, was the reading of a letter, signed by an Iowa veterinarian, to the effect that farmer vaccination was proving to be highly satisfactory in his State. This particular letter had

a very profound influence on the members of the Agricultural Committee. In addition, we had to sit and listen to the usual array of short-comings of individual veterinarians. It was never more apparent that veterinarians must at all times, let alone just now, conduct themselves as professional men, and not give stock-owners just cause for complaint. So far as the vaccination of hogs is concerned, unless a veterinarian can go out and do a better, cleaner and more satisfactory job than his client can do himself, there is no particular object in the farmer employing the veterinarian to do the work.

Serum companies were accused of being in cahoots with the veterinarians, at least those who restricted the sale of their products to veterinarians only. We might say, in this connection, that there is a clause in the proposed bill providing that a veterinarian forfeit his license to practice, if he receives any profit or rebate on serum. (One of the advocates of the bill admitted that his Farm Bureau had to sell the serum at more than cost, in order to break even.) So far as the restrictions on the sale of certain brands of serum were concerned, it was our privilege to reply to this criticism. We endeavored to show that reputable companies are highly desirous of protecting the reputation of their products, and that they had found, through experience, that the safest way to do this was by placing their products in the hands of those best fitted, by education and training, to use such delicate products. The only practical way to do this was by restricting the sale to qualified veterinarians. (After the hearing was over, one farmer acknowledged that he had never thought of it in just that light.)

We will mention just one other incident. One veterinarian who attended the hearing, while on his way to the station to catch the train for Lansing, was met by one of his fellow-townsmen. On being asked the nature of his journey, the veterinarian explained the circumstances. His friend listened attentively, and when the veterinarian had finished, this was his friend's rejoinder: "I don't see what you 'vets' want to fight that bill for. Let the farmers have serum and virus. That will mean more hog cholera and then you fellows will have lots of more work to do."

EXECUTIVE BOARD ELECTIONS

The polls for nominations of candidates for members of the Executive Board, for Districts Nos. 2 and 3, closed on April 27th.

The five members nominated in District No. 2 are:

- Dr. J. F. DeVine, of Goshen, N. Y.
- Dr. Adolph Eichhorn, of Pearl River, N. Y.
- Dr. Wm. Herbert Lowe, of Paterson, N. J.
- Dr. Robert S. MacKellar, of New York, N. Y.
- Dr. T. E. Munce, of Harrisburg, Pa.

Six names go on the election ballot in District No. 3, owing to a tie for fifth place. They are:

- Dr. S. Brenton, of Detroit, Mich.
- Dr. T. H. Ferguson, of Lake Geneva, Wis.
- Dr. Reuben Hilty, of Toledo, Ohio
- Dr. L. A. Merillat, of Chicago, Ill.
- Dr. E. L. Quitman, of Chicago, Ill.
- Dr. David S. White, of Columbus, Ohio.

It will not be necessary for us to tell who these eleven men are. Every one is well and favorably known to our entire membership, and needs no further introduction.

May the best pair win!

MOTOR TOURS TO MONTREAL

Montreal, within two days' easy motoring distance from New York, Boston and Buffalo, and connected by the King Edward Highway with the famous State roads of New York and northern New England, offers exceptional and indeed unique attractions for automobile tourists from the United States.

Montreal's key position, as the hub of a network of modern highways, makes it the logical rallying point for tourists who desire to make the most of a motor holiday in the Province of Quebec. From Quebec the new Levis-Jackman highway brings the touring motorist to the State roads system of Maine.

Montreal offers a wide variety of half-day or one-day motor trips. The circuit of the island is like a transcontinental tour in miniature, with its glimpses of the activities and industries of a modern city. A run of thirty miles take the visitor to the far-famed Oka Monastery of the Trappist monks. Another interesting short trip is Chambly, the birthplace of Madame Albani, the famous contralto, and where there may be visited a stone fort over two hundred years old.

OUR CODE OF ETHICS

Several veterinarians have recently raised the question as to how far a member of the Association might go, in advertising the fact that he was specializing in some particular branch of veterinary science, without violating our code of ethics.

The present code of ethics, as set forth in Article 19 of the By-laws, is very specific, and was so intended when originally written. It was desired to allow as little room for misinterpretation as possible, and when our opinion has been asked, we have invariably replied that a member should confine his "publicity campaign" to the publishing of his name, degree, address, office hours and telephone number.

Now comes the veterinarian who desires to announce to the public that he is specializing, perhaps in small animal practice, perhaps in the field of "bovine gynecology," perhaps in the diagnosis and treatment of lameness of horses. May he ethically direct attention to his specialty, and if so, how?

Times have changed and are changing, and it would appear that this question should be taken up and discussed now, just as well as later. It has been pointed out that members in our sister profession of medicine do not hesitate to "advertise" (we use the word with reservations), that they confine themselves to the practice of this, that or the other field of medicine or surgery, and without any apparent infraction of the code of ethics of human medicine.

Of course, if we relax, we must do so very cautiously. If some are given the proverbial inch, they will take the proverbial mile. But there is moderation in all things. We can not afford to be too straight-laced.

CANADIAN NATIONAL EXPOSITION AT TORONTO

Dr. J. A. Campbell, of Toronto, desires to call attention to the Canadian National Exhibition which is held annually in Toronto. This year the exhibition will run for two weeks, the last week in August and the first week in September. Dr. Campbell writes that it would be very much worth while for any of our members who are going to Montreal to plan to spend a couple of days at the exhibition, on their return trip. Members desiring further information in connection with this side trip will do well to communicate with Dr. Campbell, at 17 Elm St., Toronto.

HOW COME?

We wonder if we are away behind our British colleagues in the matter of veterinary education, or whether they have not yet heard of our stand on one phase of this subject. We refer to the correspondence school evil. We have not heard very much of veterinary correspondence schools lately, and had come to the conclusion that the business had ceased to be profitable.

Now comes a full-page advertisement, in the *VETERINARY JOURNAL* (London), of the Veterinary Correspondence College, offering "intensive and progressive postal tuition for all veterinary examinations for students and practitioners." The courses offered are for an array of degrees: M. R. C. V. S., B. Sc., B. V. Sc., D. V. H., F. R. C. V. S., M. V. Sc., and D. Sc. The fees are moderate and may be paid on the installment plan. Text-books are loaned free.

Perhaps we have not quite caught the right idea in this new departure. We have hesitated to write for a prospectus, for fear our intentions might be misconstrued. Have any of our readers thought it desirable to supplement their veterinary education through a correspondence course?

HYGEIA

The first number of *HYGEIA* has appeared. Conceived, planned and finally launched by the American Medical Association, there is now available to the public a monthly journal, designed to promote a better understanding and to secure more sympathetic cooperation between the medical profession and the layman. *HYGEIA* is defined as "a journal of individual and community health," and is designed for the purpose of giving "plain facts about health and disease."

In the first number (April, 1923) we find articles on food poisoning (botulism), the causes of eyestrain and their prevention, cancer, the house fly as a carrier of disease, patent medicines, yellow fever, glands of internal secretion, military training camps, Louis Pasteur and his work, chromosomes, dental clinics and others. Surely variety enough for the most critical. If the first number is a fair sample of those to follow, *HYGEIA* should meet with a warm reception. Its function, being entirely educational, is a most worthy one. Veterinarians would do well to read it regularly.

1863-1898-1923

Our Association will be sixty years old this year. The United States Veterinary Medical Association was organized, in New York City, June 9, 1863. Thirty-five years later, in 1898, at the meeting in Omaha, the name of the organization was changed to the American Veterinary Medical Association. So, this year—1923—has a double significance. It marks the sixtieth anniversary of our birth, and a quarter of a century of our existence as the American Veterinary Medical Association.

MEMBERSHIP CAMPAIGN

Our campaign for new members is under way. We have planned a very intensive one this year, and with the publicity given the membership campaigns of last year and the year before, we hope that a very healthy increase in our numerical strength will be the result of the efforts which will be put forth during the next three months.

On another page will be found a complete list of President Welch's appointments as Resident Secretaries. These men have been selected with a great deal of care. They have accepted these appointments under promises to work. These men will work—there is no doubt of that. But we want every member to work, too.

Look around you, no matter where you are located, no matter what the branch of the profession in which you are engaged, and you will no doubt discover some veterinarian who would make a good member of our Association. Send in his name, with your recommendation, to your State Secretary. He will do the rest.

We are in a better position than ever before to assist our Resident Secretaries to get new members. We have installed multigraphing equipment in the Association offices, and we are prepared to get out a circular letter to prospects, in any state or province, at very short notice. We will prepare the letters, address and stamp the envelopes, so that all the Resident Secretary will have to do will be to sign the letters and place them in the mail.

During our travels of the past few months (we have been in fourteen states) we have met several veterinarians who have never had an invitation to join the Association. Others have

written in and asked how they could join. We did not lose any time telling them, you may rest assured.

Did it ever occur to you how easy it would be to double our membership? All that would be necessary would be for every present member to get one new member. Will you get yours?

COMMITTEE APPOINTMENTS

All members of the Association who have been appointed on committees, by President Welch, were so notified by the Secretary some time ago. As a timely reminder of these committee assignments, we are publishing in this issue of the JOURNAL a complete list of these committees, with the names and addresses of the chairmen and members. Turn to the list and see whether you are on a committee, if you do not wish to trust your memory. Some of these committees should now be hard at work. Others should be planning for their work that will come later, as the time of the Montreal meeting approaches.

Do not let your committee work go until the last minute. Reports gotten together in a hurry, and in the confusion which exists at the convention, are never as satisfactory as those which have received more calm and careful consideration. Get in touch with the chairman of your committee at once, unless you have already done so. And do not forget that the Secretary-Editor stands ready to assist your committee whenever and wherever possible. Make use of him now. He will be pretty busy later on.

LAPEL EMBLEMS

The lapel emblem officially adopted by the American Veterinarian Medical Association at the St. Louis convention is now available to our members. Those who have seen the emblem have appeared to be highly pleased with it. The Executive Board, at the meeting in December, directed the Secretary to procure five hundred of these emblems, and to sell them to members at fifty cents each. See page 17 of the advertising section for directions for ordering. Get yours before you go to Montreal!

COMING VETERINARY MEETINGS

- Massachusetts Veterinary Association. Young's Hotel, Boston, Mass. May 23, 1923. Dr. C. H. Playdon, Secretary, Reading, Mass.
- North Central Iowa Veterinary Medical Association. Fort Dodge, Iowa. May 29, 1923. Dr. H. J. Shore, Secretary, Fort Dodge, Iowa.
- Colorado Veterinary Medical Association. Fort Collins, Colo., May 31, June 1, 2, 1923. Dr. I. E. Newsom, Secretary, Fort Collins, Colo.
- New York City, Veterinary Medical Association of. Academy of Medicine, 17 W. 43rd St., New York, N. Y. June 6, 1923. Dr. C. G. Rohrer, Secretary, 40 W. 61st St., New York, N. Y.
- California State Veterinary Medical Association. San Francisco, Cal. June 21, 22, 23, 1923. Dr. J. P. Bushong, Secretary, 908 Lindsay St., Los Angeles, Cal.
- Michigan State Veterinary Medical Association. East Lansing, Mich. June 26, 27, 28, 1923. Dr. R. A. Runnells, Secretary, East Lansing, Mich.
- North Carolina State Veterinary Medical Association. Statesville, N. C. June 27, 28, 1923. Dr. J. P. Spoon, Secretary, Burlington, N. C.
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STATE BOARD EXAMINATIONS

- California State Board of Examiners. San Francisco, Cal. June 20, 1923. Dr. John L. Tyler, Secretary, 120 E. Belgrave Ave., Huntington Park, Cal.
- Illinois State Board of Examiners. Senate Room Capitol, Springfield, Ill. June 25-26, 1923.
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NEW ENGLAND TUBERCULOSIS CONFERENCE

A Tuberculosis Eradication Conference will be held at Concord, N. H., June 12-13, 1923. This is the third such conference to be held in New England. A very comprehensive program is being arranged, and will be of equal interest and importance to the cattle breeder as well as the veterinarian or sanitary control official. Plan to attend.

PRELIMINARY REPORT ON THE DIFFERENTIATION OF VARIOUS ORGANISMS BELONGING TO THE HEMORRHAGIC SEPTICEMIA GROUP¹

C. P. FITCH and E. N. NELSON,
University of Minnesota, St. Paul, Minnesota.

Knowledge is an asset in any line of work and as our information increases along certain lines of investigation, often times our opinions change. It is not many years ago, that Lignieres, Bollinger, Hüppe and Trevisan completed their contributions to the knowledge of the germs causing a group of conditions which the latter author referred to as the "Pasteurelloses." Additional work has given us much more light on many of these diseases, but there still remain many puzzling questions which are not yet satisfactorily answered. For example, the relation of the hemorrhagic septicemia organism to disease among swine and even more puzzling, the great apparent discrepancy between field and laboratory results in immunizing against this group of infections. It is quite possible that when more is known concerning the germs themselves, many of the intricate situations will become less complicated. It has been learned, in comparatively recent years, that lobar pneumonia, in man, is caused by a germ, the pneumococcus, which has several different types, only one of which lends itself to biological therapy. The continued study of the colon-typhoid group has shown many relationships which have aided in the prevention and control of the diseases caused by members of this class. The science of bacteriology is comparatively young and many unexplored vistas are before us.

Last year Jones presented a paper before this Association in which he pointed out that members of the hemorrhagic septicemia group possess various biological characters, especially as to their action on carbohydrate media. He was able to separate the organisms into three rather distinct groups. Group I fermented dextrose, lactose, saccharose, maltose and mannite, but did not alter greatly the hydrogen ion concentration of salicin. These organisms also produced hemolysis, but no indol. Group II acidulated dextrose and saccharose, but not the others. All produced indol and none were hemolytic. Group III, of two strains only, fermented dextrose, saccharose and mannite, but produced no acidity in lactose, maltose or salicin. Both

¹Presented at the fifty-ninth annual meeting of the American Veterinary Medical Association, St. Louis, Mo., August 28 to September 1, 1922.

strains formed indol, but did not hemolyze red blood corpuscles. Group I was of relatively low virulence, Group II was slightly more virulent and one member of Group III was also virulent for rabbits. The results of the agglutination tests with serum from rabbits, immunized to organisms of each group, showed definite relationships. Jones summarizes his work by stating that, "It has been possible by studying their fermentation and other characters to divide them into three well-defined groups. In the main serological relationship has been found to follow the cultural grouping."

Meyer in 1915 studied a case of skin disease in a woman which he diagnosed as pemphigus vulgaris. From this he isolated an organism, which he considered belonged to the hemorrhagic septicemia group. In reviewing the literature on this phase, he states that Lorey found in the blood of a patient (man), who presented symptoms of abdominal typhoid, a hemorrhagic septicemia organism. Fränkel and Pielsticher found in the blood and bone marrow of a man who had been poisoned by a fish bone, an organism belonging to the same group. Saisawa also isolated a similar organism from a case of pseudo-tuberculosis of man. The organism isolated by Meyer came from the blisters of the case, and was pathogenic for white rats, but not for rabbits. The author explains this by stating that the germ had lost its pathogenicity for rabbits by its passage through man. He believes that a variety of diseases are caused in man by organisms belonging to the hemorrhagic septicemia group.

Busson in 1921 isolated two strains of an organism from an epizootic among guinea-pigs. These organisms he believed belonged to the hemorrhagic septicemia group. Both were motile, neither fermented lactose, but one produced gas in glucose and acidulated mannit and maltose. The other had no action on the carbohydrates but grew on potato. The author studied a large number of organisms, supposedly belonging to the hemorrhagic septicemia group, among which were several which have not been described as occurring in this country. It is most interesting to note that he also included in this group, the organism described by Billings in 1888 as the cause of Texas fever and which Smith pointed out in 1893, undoubtedly belonging to the colon-typhoid group. Busson, as well as the next investigators, includes many organisms in the hemorrhagic septicemia group, which according to the standards set in this country, do not rightfully belong to it. These German and Austrian investigators apparently do not

know of the work done in America. They have an entirely different basis for classifying their organisms, and are woefully ignorant of the bacteriological work published in this country. Busson concludes however, as a result of his studies, that there are many types in the hemorrhagic septicemia group.

Plasaj and Pribram divide the group into three separate orders in their system, based on a study of twenty cultures from the Kral museum. In the first order they made four groups, as designated by (1) *B. pestis*, (2) *B. pseudopestis*, (pseudo-tuberculosis rodentium), (3) *B. parapestis* (Fornet) and (4) *B. multiseptica*. This latter has three types, Alpha, Beta and Gamma, depending upon whether they are atrichial, monotrichial, or oligotrichial. These authors also found a varied serological relationship.

It is clearly apparent to anyone that bacteriological work carried on in this country and that done abroad, so far as this particular group is concerned, is not comparable, as the organisms studied are apparently widely different. The results of the foreign investigators here referred to are most interesting, in that they show somewhat definite serological grouping, even among the widely divergent types studied.

The work to be reported in this paper is merely preliminary to a thorough study of the organisms, commonly referred to in this country as the hemorrhagic septicemia group. We also intend to procure some from the Kral museum and other European sources. These will be compared with those isolated in this country. We have studied, to date, twenty-eight strains obtained from various laboratories in different parts of the United States. These were isolated from diseased animals (cattle, hogs, sheep and poultry). They were all short, non-motile rods.

BIOCHEMICAL RESULTS

The first problem we attacked was to learn if these organisms fell into three groups as determined by their action on various carbohydrate media. The method employed was that described by Fitch and Billings. The pH values, as determined by the indicators, were checked from time to time on a Leeds and Northrup portable potentiometer.

The following tables show the action of twenty-eight strains of organisms belonging to the hemorrhagic septicemia group on seven carbohydrates:

TABLE I

DEXTROSE

BOVINE STRAINS				PORCINE STRAINS				AVIAN STRAINS				OVINE STRAINS			
pH of Duplicate Cultures				pH of Duplicate Cultures				pH of Duplicate Cultures				pH of Duplicate Cultures			
3 Day Incubation	7 Day Incubation	12 Day Incubation		3 Day Incubation	7 Day Incubation	12 Day Incubation		3 Day Incubation	7 Day Incubation	12 Day Incubation		3 Day Incubation	7 Day Incubation	12 Day Incubation	
Uninoculated Control 7.4				Uninoculated Control 7.4				Uninoculated Control 7.4				Uninoculated Control 7.4			
Culture Number				Culture Number				Culture Number				Culture Number			
15	6.4-6.4	6.4-6.4	6.4-6.4	13A	6.1-6.2	6.1-6.2	6.1-6.2	1666	6.3-6.3	6.3-6.3	6.3-6.3	52	6.4-6.4	6.4-6.4	6.4-6.3
12	6.4-6.4	6.4-6.4	6.4-6.4	19	6.4-6.4	6.4-6.4	6.4-6.4	1675	6.3-6.3	6.3-6.3	6.2-6.2	23	6.4-6.3	6.4-6.3	6.2-6.1
14	6.3-6.3	6.3-6.3	6.3-6.3	17	6.3-6.3	6.3-6.3	6.3-6.3	28	6.2-6.4	6.2-6.4	6.2-6.2				
18	6.2-6.2	6.2-6.2	6.4-6.2	11	6.3-6.3	6.3-6.3	6.3-6.3	58	6.1-6.2	6.1-6.2	6.1-6.1				
17	6.1-6.2	6.1-6.2	6.3-6.2	14	6.4-6.4	6.4-6.4	6.2-6.1	59	6.3-6.3	6.3-6.3	6.2-6.1				
22	6.4-6.3	6.4-6.3	6.5-6.4	12	6.5-6.5	6.5-6.5	6.4-6.4	6274	6.2-6.2	6.2-6.2	6.2-6.2				
20	6.4-6.5	6.4-6.5	6.3-6.3	64	6.3-6.3	6.3-6.3	6.3-6.3								
40	6.3-6.3	6.4-6.3	6.4-6.3	4	6.3-6.3	6.3-6.3	6.2-6.2								
1168	6.2-6.3	6.2-6.3	6.3-6.3	13	6.2-6.3	6.2-6.3	6.2-6.2								
6070	6.2-6.3	6.2-6.3	6.3-6.2	9	6.3-6.3	6.3-6.3	6.3-6.3								
	Avg.	Avg.	Avg.		Avg.	Avg.	Avg.		Avg.	Avg.	Avg.		Avg.	Avg.	Avg.
	6.30	6.21	6.33		6.32	6.32	6.26		6.25	6.25	6.19		6.37	6.37	6.25

TABLE II

LACTOSE

Culture Number	BOVINE STRAINS				PORCINE STRAINS				AVIAN STRAINS				OVINE STRAINS			
	pH of Duplicate Cultures				pH of Duplicate Cultures				pH of Duplicate Cultures				pH of Duplicate Cultures			
	3 Day Incubation	7 Day Incubation	12 Day Incubation	Culture Number	3 Day Incubation	7 Day Incubation	12 Day Incubation	Culture Number	3 Day Incubation	7 Day Incubation	12 Day Incubation	Culture Number	3 Day Incubation	7 Day Incubation	12 Day Incubation	
	Uninoculated Control 7.4				Uninoculated Control 7.4				Uninoculated Control 7.4				Uninoculated Control 7.4			
15	7.4-7.4	7.3-7.3	7.3-7.3	13A	7.4-7.3	7.4-7.3	7.3-7.2	1666	7.4-7.4	7.3-7.3	7.3-7.3	52	7.3-7.3	7.3-7.3	7.3-7.3	
12	7.3-7.3	7.2-7.3	7.2-7.1	19	7.2-7.3	7.2-7.3	7.2-7.2	1675	7.3-7.2	7.2-7.3	7.2-7.2	23	7.4-7.4	7.3-7.2	7.2-7.2	
14	7.4-7.4	7.2-7.2	7.3-7.4	17	7.4-7.4	7.3-7.3	7.2-7.3	28	7.3-7.3	7.1-7.2	7.1-7.1					
18	7.3-7.2	7.2-7.2	7.4-7.4	11	7.2-7.2	7.2-7.2	7.2-7.2	58	7.3-7.2	7.3-7.3	7.2-7.3					
17	7.4-7.3	7.4-7.4	7.3-7.5	14	7.3-7.2	7.1-7.2	7.2-7.1	59	7.2-7.3	7.3-7.3	7.3-7.2					
22	7.4-7.4	7.3-7.3	7.4-7.3	12	7.3-7.4	7.2-7.1	7.3-7.3	6274	7.3-7.3	7.4-7.2	7.1-7.1					
20	7.2-7.2	7.2-7.2	7.3-7.2	64	7.4-7.4	7.3-7.3	7.3-7.3									
40	7.4-7.4	7.3-7.3	7.3-7.2	4	7.2-7.3	7.2-7.2	7.2-7.2									
1168	7.4-7.4	7.3-7.2	7.5-7.6	13	7.4-7.3	7.4-7.4	7.4-7.4									
6070	7.3-7.2	7.1-7.2	7.2-7.1	9	7.2-7.3	7.2-7.3	7.6-7.6									
	Avg.	Avg.	Avg.		Avg.	Avg.	Avg.		Avg.	Avg.	Avg.		Avg.	Avg.	Avg.	
	7.33	7.25	7.31		7.30	7.25	7.28		7.29	7.26	7.20		7.35	7.27	7.25	

TABLE III

SACCHAROSE

Culture Number	BOVINE STRAINS				PORCINE STRAINS				Culture Number				AVIAN STRAINS				Culture Number				OVINE STRAINS			
	pH of Duplicate Cultures				pH of Duplicate Cultures				pH of Duplicate Cultures				pH of Duplicate Cultures				pH of Duplicate Cultures				pH of Duplicate Cultures			
	3 Day Incubation	7 Day Incubation	12 Day Incubation		3 Day Incubation	7 Day Incubation	12 Day Incubation		3 Day Incubation	7 Day Incubation	12 Day Incubation		3 Day Incubation	7 Day Incubation	12 Day Incubation		3 Day Incubation	7 Day Incubation	12 Day Incubation		3 Day Incubation	7 Day Incubation	12 Day Incubation	
	Uninoculated Control 7.5				Uninoculated Control 7.5				Uninoculated Control 7.5				Uninoculated Control 7.5				Uninoculated Control 7.5				Uninoculated Control 7.5			
15	6.6-6.6	6.4-6.4	6.3-6.3	13A	6.4-6.4	6.6-6.6	6.3-6.3	1666	6.5-6.4	6.7-6.7	6.7-6.7	52	6.6-6.7	6.6-6.6	6.4-6.4		6.6-6.7	6.6-6.6	6.4-6.4		6.6-6.7	6.6-6.6	6.4-6.4	
12	6.8-6.8	6.5-6.5	6.3-6.3	19	6.4-6.3	6.4-6.4	6.4-6.3	1675	6.8-6.8	6.4-6.4	6.3-6.3	23	6.7-6.7	6.3-6.3	6.3-6.3		6.7-6.7	6.3-6.3	6.3-6.3		6.7-6.7	6.3-6.3	6.3-6.3	
14	6.7-6.7	6.5-6.4	6.5-6.5	17	6.2-6.2	6.4-6.4	6.4-6.5	28	6.6-6.5	6.4-6.3	6.3-6.3		6.6-6.5	6.4-6.3	6.3-6.3		6.6-6.5	6.4-6.3	6.3-6.3		6.6-6.5	6.4-6.3	6.3-6.3	
18	6.8-6.6	6.6-6.6	6.2-6.2	11	6.4-6.4	6.5-6.6	6.3-6.3	58	6.8-6.8	6.7-6.7	6.4-6.5		6.8-6.8	6.7-6.7	6.4-6.5		6.8-6.8	6.7-6.7	6.4-6.5		6.8-6.8	6.7-6.7	6.4-6.5	
17	6.6-6.6	6.4-6.4	6.3-6.2	14	6.4-6.3	6.3-6.3	6.3-6.2	59	6.8-6.8	6.7-6.7	6.3-6.3		6.8-6.8	6.7-6.7	6.3-6.3		6.8-6.8	6.7-6.7	6.3-6.3		6.8-6.8	6.7-6.7	6.3-6.3	
22	6.8-6.8	6.3-6.3	6.4-6.6	12	6.6-6.6	6.4-6.4	6.4-6.2	6274	6.8-6.8	6.4-6.4	6.2-6.2		6.8-6.8	6.4-6.4	6.2-6.2		6.8-6.8	6.4-6.4	6.2-6.2		6.8-6.8	6.4-6.4	6.2-6.2	
20	6.4-6.4	6.3-6.3	6.3-6.4	64	6.8-6.7	6.3-6.3	6.4-6.3																	
40	6.7-6.7	6.6-6.6	6.6-6.6	4	6.6-6.6	6.6-6.5	6.3-6.2																	
1168	6.8-6.7	6.7-6.8	6.5-6.5	13	6.4-6.5	6.7-6.6	6.6-6.7																	
6070	6.7-6.7	6.4-6.4	6.4-6.4	9	6.4-6.4	6.6-6.6	6.3-6.3																	
	Avg.	Avg.	Avg.		Avg.	Avg.	Avg.		Avg.	Avg.	Avg.		Avg.	Avg.	Avg.		Avg.	Avg.	Avg.		Avg.	Avg.	Avg.	
	6.67	6.47	6.39		6.45	6.47	6.35		6.70	6.54	6.37		6.70	6.54	6.37		6.67	6.42	6.37		6.67	6.42	6.37	

TABLE IV

MANNITE

Culture Number	BOVINE STRAINS				PORCINE STRAINS				Culture Number				AVIAN STRAINS				Culture Number				OVINE STRAINS			
	pH of Duplicate Cultures				pH of Duplicate Cultures				pH of Duplicate Cultures				pH of Duplicate Cultures				pH of Duplicate Cultures				pH of Duplicate Cultures			
	3 Day Incubation	7 Day Incubation	12 Day Incubation		3 Day Incubation	7 Day Incubation	12 Day Incubation		3 Day Incubation	7 Day Incubation	12 Day Incubation		3 Day Incubation	7 Day Incubation	12 Day Incubation		3 Day Incubation	7 Day Incubation	12 Day Incubation		3 Day Incubation	7 Day Incubation	12 Day Incubation	
	Uninoculated Control 7.4				Uninoculated Control 7.4				Uninoculated Control 7.4				Uninoculated Control 7.4				Uninoculated Control 7.4				Uninoculated Control 7.4			
15	6.9-6.9	6.4-6.4	6.3-6.3	13A	6.8-6.9	6.3-6.2	6.2-6.1	1666	6.7-6.7	6.3-6.4	6.2-6.2	52	6.7-6.7	6.4-6.3	6.3-6.3		6.7-6.7	6.4-6.3	6.3-6.3		6.7-6.7	6.4-6.3	6.3-6.3	
12	6.8-6.7	6.2-6.3	6.1-6.1	9	6.8-6.8	6.2-6.2	6.2-6.1	1675	6.8-6.7	6.2-6.2	6.2-6.2	23	6.7-6.7	6.4-6.3	6.3-6.3		6.7-6.7	6.4-6.3	6.3-6.3		6.7-6.7	6.4-6.3	6.3-6.3	
14	6.7-6.7	6.4-6.4	5.9-5.9	17	6.9-6.9	6.4-6.4	6.2-6.3	28	6.8-6.8	6.2-6.2	6.3-6.3		6.8-6.8	6.1-6.1	6.1-6.2									
18	6.7-6.8	6.4-6.4	6.0-6.0	11	6.8-6.8	6.4-6.5	6.3-6.2	58	6.8-6.8	6.1-6.1	6.1-6.2													
17	6.7-6.7	6.3-6.2	6.3-6.0	14	6.8-6.8	6.3-6.3	6.1-6.1	59	6.7-6.8	6.1-6.1	6.2-6.2													
22	6.6-6.7	6.4-6.4	6.3-6.2	12	6.7-6.7	6.4-6.5	6.3-6.3	6274	6.8-6.8	5.9-6.1	6.2-6.1													
20	6.8-6.7	6.5-6.5	6.5-6.7	64	6.7-6.8	6.4-6.4	6.4-6.4																	
40	6.6-6.8	6.2-6.1	6.3-6.3	4	6.7-6.7	6.3-6.3	6.2-6.2																	
1168	6.7-6.7	6.2-6.2	6.1-6.2	13	6.7-6.7	6.2-6.2	6.2-6.2																	
6070	6.6-6.6	6.2-6.2	6.1-6.1	9	6.8-6.9	6.1-6.1	6.2-6.2																	
	Avg.	Avg.	Avg.		Avg.	Avg.	Avg.		Avg.	Avg.	Avg.		Avg.	Avg.	Avg.		Avg.	Avg.	Avg.		Avg.	Avg.	Avg.	
	6.72	6.32	6.28		6.78	6.30	6.22		6.76	6.15	6.20		6.76	6.15	6.20		6.70	6.47	6.30		6.70	6.47	6.30	

TABLE V

MALTOSE

MALTOSE																			
BOVINE STRAINS					PORCINE STRAINS					AVIAN STRAINS					OVINE STRAINS				
Culture Number	pH of Duplicate Cultures				Culture Number	pH of Duplicate Cultures				Culture Number	pH of Duplicate Cultures				Culture Number	pH of Duplicate Cultures			
	3 Day Incubation	7 Day Incubation	12 Day Incubation			3 Day Incubation	7 Day Incubation	12 Day Incubation			3 Day Incubation	7 Day Incubation	12 Day Incubation			3 Day Incubation	7 Day Incubation	12 Day Incubation	
	Uninoculated Control 7.6					Uninoculated Control 7.6					Uninoculated Control 7.6					Uninoculated Control 7.6			
15	7.2-7.2	7.2-7.2	7.4-7.4		13A	7.3-7.2	7.5-7.3	7.3-7.3	1666	7.3-7.4	7.3-7.3	7.4-7.4	52	7.4-7.4	7.4-7.4	7.4-7.3			
12	7.3-7.2	7.3-7.3	7.3-7.3		19	7.5-7.6	7.2-7.2	7.4-7.3	1675	7.4-7.5	7.2-7.3	7.4-7.4	23	7.3-7.4	7.4-7.4	7.3-7.2			
14	7.2-7.2	7.3-7.2	7.4-7.4		17	7.2-7.2	7.2-7.2	7.4-7.2	28	7.4-7.4	7.4-7.4	7.4-7.4							
18	7.2-7.2	7.2-7.4	7.2-7.2		11	7.4-7.4	7.4-7.4	7.5-7.7	58	7.2-7.4	7.3-7.3	7.4-7.3							
17	7.3-7.2	7.3-7.2	7.4-7.4		14	7.2-7.3	7.4-7.4	7.2-7.3	59	7.4-7.4	7.3-7.3	7.4-7.4							
22	7.2-7.4	7.2-7.2	7.5-7.5		12	7.4-7.4	7.4-7.4	7.2-7.1	6274	7.5-7.5	7.4-7.4	7.4-7.4							
20	7.3-7.3	7.3-7.3	7.3-7.2		64	7.5-7.6	7.4-7.4	7.5-7.5											
40	7.3-7.4	7.2-7.2	7.3-7.2		4	7.5-7.5	7.5-7.5	7.5-7.5											
1168	7.4-7.4	7.3-7.3	7.3-7.3		13	7.3-7.3	7.3-7.4	7.4-7.4											
6070	7.4-7.5	7.5-7.6	7.6-7.7		9	7.5-7.5	7.4-7.5	7.4-7.5											
	Avg.	Avg.	Avg.			Avg.	Avg.	Avg.		Avg.	Avg.	Avg.		Avg.	Avg.	Avg.			
	7.29	7.28	7.36			7.39	7.37	7.38		7.40	7.32	7.39		7.37	7.40	7.30			

TABLE VI

DULCIT

BOVINE STRAINS				PORCINE STRAINS				AVIAN STRAINS				OVINE STRAINS			
pH of Duplicate Cultures				pH of Duplicate Cultures				pH of Duplicate Cultures				pH of Duplicate Cultures			
3 Day Incubation	7 Day Incubation	12 Day Incubation		3 Day Incubation	7 Day Incubation	12 Day Incubation		3 Day Incubation	7 Day Incubation	12 Day Incubation		3 Day Incubation	7 Day Incubation	12 Day Incubation	
Uninoculated Control 7.6				Uninoculated Control 7.6				Uninoculated Control 7.6				Uninoculated Control 7.6			
Culture Number				Culture Number				Culture Number				Culture Number			
15	7.4-7.4	7.2-7.2	7.2-7.2	13A	7.3-7.4	7.3-7.2	7.3-7.2	1666	7.4-7.4	7.2-7.2	7.2-7.2	52	7.4-7.4	7.2-7.2	7.2-7.2
12	7.3-7.4	7.2-7.3	7.2-7.2	19	7.4-7.4	7.2-7.2	7.2-7.2	1675	7.4-7.5	7.2-7.2	7.2-7.1	23	7.2-7.4	7.2-7.2	7.2-7.1
14	7.3-7.3	7.4-7.4	7.2-7.2	17	7.3-7.3	7.1-7.1	7.3-7.3	28	7.4-7.4	7.2-7.1	7.1-7.1				
18	7.3-7.2	7.2-7.2	7.2-7.3	11	7.4-7.5	7.3-7.3	7.2-7.2	58	7.3-7.3	7.1-7.1	7.2-7.2				
17	7.4-7.4	7.3-7.3	7.2-7.1	14	7.5-7.5	7.4-7.4	7.2-7.2	59	7.3-7.3	7.3-7.3	7.3-7.2				
22	7.3-7.4	7.2-7.2	7.1-7.1	12	7.4-7.4	7.4-7.4	7.2-7.1	6274	7.3-7.5	7.4-7.4	7.1-7.1				
20	7.3-7.4	7.3-7.3	7.2-7.3	64	7.3-7.3	7.2-7.2	7.2-7.2								
40	7.5-7.5	7.2-7.3	7.1-7.1	4	7.5-7.5	7.3-7.3	7.2-7.1								
1168	7.6-7.6	7.1-7.2	7.1-7.1	13	7.4-7.4	7.2-7.2	7.2-7.2								
6070	7.4-7.5	7.2-7.3	7.2-7.2	9	7.4-7.4	7.2-7.2	7.4-7.4								
	Avg.	Avg.	Avg.		Avg.	Avg.	Avg.		Avg.	Avg.	Avg.		Avg.	Avg.	Avg.
	7.39	7.25	7.17		7.40	7.25	7.22		7.37	7.22	7.16		7.35	7.2	7.17

TABLE VII

SALICIN

Culture Number	BOVINE STRAINS				PORCINE STRAINS				Culture Number				AVIAN STRAINS				Culture Number				OVINE STRAINS			
	pH of Duplicate Cultures				pH of Duplicate Cultures				pH of Duplicate Cultures				pH of Duplicate Cultures				pH of Duplicate Cultures				pH of Duplicate Cultures			
	3 Day Incubation	7 Day Incubation	12 Day Incubation		3 Day Incubation	7 Day Incubation	12 Day Incubation		3 Day Incubation	7 Day Incubation	12 Day Incubation		3 Day Incubation	7 Day Incubation	12 Day Incubation		3 Day Incubation	7 Day Incubation	12 Day Incubation		3 Day Incubation	7 Day Incubation	12 Day Incubation	
	Uninoculated Control 7.6				Uninoculated Control 7.6				Uninoculated Control 7.6				Uninoculated Control 7.6				Uninoculated Control 7.6				Uninoculated Control 7.6			
15	7.2-7.2	7.2-7.2	7.2-7.1	13A	7.2-7.2	7.2-7.1	7.1-7.1	1666	7.3-7.3	7.2-7.2	7.2-7.2	52	7.4-7.4	7.4-7.4	7.4-7.4	7.4-7.4	7.4-7.4	7.4-7.4	7.4-7.4	7.4-7.4	7.4-7.4	7.4-7.4	7.4-7.4	7.4-7.4
12	7.2-7.2	7.5-7.4	7.2-7.2	19	7.4-7.4	7.3-7.3	7.2-7.2	1675	7.2-7.2	7.1-7.2	7.1-7.1	23	7.3-7.2	7.4-7.4	7.4-7.4	7.3-7.3	7.3-7.2	7.4-7.4	7.4-7.4	7.3-7.3	7.3-7.2	7.4-7.4	7.3-7.3	7.3-7.3
14	7.2-7.2	7.3-7.3	7.1-7.1	17	7.6-7.5	7.4-7.4	7.3-7.2	28	7.6-7.6	7.5-7.5	7.2-7.2													
18	7.3-7.4	7.3-7.2	7.2-7.2	11	7.4-7.4	7.3-7.3	7.2-7.2	58	7.5-7.4	7.7-7.5	7.2-7.3													
17	7.4-7.3	7.3-7.2	7.3-7.3	14	7.5-7.6	7.3-7.3	7.2-7.1	59	7.3-7.3	7.3-7.3	7.1-7.1													
22	7.2-7.2	7.4-7.4	7.3-7.2	12	7.3-7.4	7.2-7.2	7.3-7.2	6274	7.4-7.4	7.3-7.3	7.2-7.2													
20	7.3-7.3	7.2-7.2	7.1-7.1	64	7.5-7.5	7.3-7.3	7.3-7.3																	
40	7.4-7.3	7.4-7.3	7.3-7.3	4	7.4-7.5	7.4-7.3	7.3-7.4																	
1168	7.3-7.3	7.2-7.2	7.1-7.2	13	7.3-7.3	7.6-7.6	7.2-7.2																	
6070	7.3-7.3	7.4-7.4	7.2-7.2	9	7.4-7.3	7.3-7.4	7.2-7.3																	
	Avg.	Avg.	Avg.		Avg.	Avg.	Avg.		Avg.	Avg.	Avg.		Avg.	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.	Avg.
	7.27	7.30	7.18		7.41	7.33	7.22		7.37	7.34	7.17		7.37	7.34	7.17		7.32	7.40	7.35		7.32	7.40	7.35	

Tables showing the action of twenty-eight strains of organisms belonging to the hemorrhagic septicemia group on seven carbohydrates:

Tables I-VII show that the results were surprisingly uniform, and that all strains acted approximately the same in the particular carbohydrate medium. No groups could be differentiated by this method. It will be noted that all strains acidulate dextrose, saccharose and mannite, while lactose, maltose, dulcitol and salicin are changed but little. All the organisms fall into Jones' Group III. The tables show that often the cultures incubated for twelve days developed the greatest amount of acid. This is especially true of mannite. The strains of bovine, porcine, avian and ovine origin, all showed approximately the same changes. All strains were slightly more acid after incubation than the uninoculated control. This change was not great enough nor sufficiently uniform to be relied on for differential purposes. None of the strains produced gas in any media. These results agree with those reported by Besemer for hemorrhagic septicemia organisms isolated in this country, (except J² which acidulated dulcitol) and corresponds to the cultural requirements ordinarily expected of organisms in this group.

SEROLOGICAL RESULTS

A rabbit was immunized to avian strain 1666. Great care had been taken in the immunizing process, as apparently this strain was quite pathogenic and several rabbits were killed before a suitable serum was procured. Table VIII shows the results of the agglutination test of this immune serum on the twenty-eight strains:

It will be noted that the organisms fall into four fairly well-defined groups, depending on their agglutinability by this serum. There seems to be little if any difference between the strains isolated from the different species of animals. For example, bovine strains appear in each group. There does, however, appear to be a marked serological difference between certain of the cultures.

A second series of rabbits were immunized to porcine strain 14, one of those which were not agglutinated by the immune serum of avian strain 1666. Table IX shows the results of the agglutination tests with this latter serum, on the strains which were not affected by the first serum.

TABLE VIII

RESULTS OF AGGLUTINATION TESTS OF VARIOUS STRAINS OF
THE HEMORRHAGIC SEPTICEMIA GROUP WITH SERUM OF
RABBIT IMMUNIZED TO AVIAN STRAIN 1666

ORGANISM	DILUTIONS					
	1-20	1-40	1-80	1-160	1-320	1-640
Bovine 6070	+	+	+	+	+	+
Bovine 20	+	+	+	+	+	+
Bovine 40	+	+	+	+	+	+
Bovine 14	+	+	+	+	+	+
Bovine 17	+	+	+	+	+	+
Porcine 19	+	+	+	+	+	+
Porcine 12	+	+	+	+	+	+
Avian 59	+	+	+	+	+	+
Avian 1666	+	+	+	+	+	+
Avian 6274	+	+	+	+	+	+
Avian 58	+	+	+	+	+	+
Avian 1675	+	+	+	+	+	+
Bovine 12	+	+	+	+	-	-
Bovine 22	+	+	+	+	-	-
Porcine 4	+	+	+	+	-	-
Ovine 52	+	+	+	+	-	-
Bovine 15	+	+	+	-	-	-
Porcine 64	+	+	+	-	-	-
Porcine 11	+	+	+	-	-	-
Porcine 13	+	+	+	-	-	-
Avian 28	+	+	+	-	-	-
Ovine 23	+	+	+	-	-	-
Bovine 18	-	-	-	-	-	-
Bovine 17	-	-	-	-	-	-
Bovine 1168	-	-	-	-	-	-
Porcine 13A	-	-	-	-	-	-
Porcine 14	-	-	-	-	-	-
Porcine 9	-	-	-	-	-	-
Normal Serum	-	-	-	-	-	-
No Serum	-	-	-	-	-	-

TABLE IX

RESULTS OF AGGLUTINATION TESTS OF VARIOUS STRAINS OF THE HEMORRHAGIC SEPTICEMIA GROUP WITH SERUM OF RABBIT IMMUNIZED TO PORCINE STRAIN 14

ORGANISM		DILUTIONS					
		1-20	1-40	1-80	1-160	1-320	1-640
Bovine	18	+	+	+	+	+	+
Bovine	17	+	+	+	+	+	+
Bovine	1168	+	+	+	+	+	+
Porcine	14	+	+	+	+	+	+
Porcine	9	+	+	+	+	+	+
Porcine	13A	—	—	—	—	—	—

It will be noted that all of the six strains, with one notable exception, are completely agglutinated by this serum. The exception is another porcine strain which was not in the least agglutinated. These results rather clearly show that there is a serological grouping between the strains studied even though their biochemical actions have failed to show distinction.

PATHOGENICITY STUDIES

A few tests have been made of the virulence of some of the strains. Avian strain 1666 is very pathogenic for rabbits, one ten-thousandth of a platinum loop taken from an agar culture injected subcutaneously, produced death uniformly in 24 hours. Avian strain 58 was likewise very virulent for rabbits. Bovine strain 18 was quite avirulent, as was also porcine strain 14. It will be noted that as far as has been determined, the pathogenicity tests agree with the serological grouping.

DISCUSSION

The results of this preliminary work show that there are many strains of hemorrhagic septicemia organisms in this country, which have a constant action on carbohydrates and which cannot be differentiated by this biochemical method. On the other hand, bacteria have been isolated and described which may belong to this group but which have a different action on carbohydrates. It is interesting to record that DeKruif, working with two varieties of a microbe existing in cultures of the rabbit septicemia bacillus, found that although mutation took place

and some quite different characters developed, their fermentation reactions remain indistinguishable. He refers to these as types D and G, the former being the parent stock.

Foreign investigators apparently have no regard for the report of the Committee of the Society of American Bacteriologists on characterization and classification of bacterial types. This report classifies, under the Pasteurella, "Gram-negative rods, aerobic and facultative. Powers of carbohydrate fermentation slight, no gas produced, gelatin not liquified. Parasitic, frequently pathogenic, producing plague in man and hemorrhagic septicemia of animals." The European investigators have a much larger hemorrhagic septicemia group, including motile and non-motile organisms, and those which produce gas. Their grouping is not comparable to ours.

It would seem from the limited work done that the organisms of the hemorrhagic septicemia group possess serological relationships, and that continued work may demonstrate rather definite types for this group of bacteria and thereby possibly clear up some of the puzzling problems which now confront the laboratory worker and the clinician, dealing with hemorrhagic septicemia in its various forms.

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DISCUSSION

DR. V. A. MOORE (Ithaca, N. Y.): I am much interested in the results of the work shown in the paper by Dr. Fitch. I feel, however, that the uniformity in the tests made of the cultures studied may not obtain in the pathogenesis or disease-producing form of the different members of the so-called septicemia hemorrhagica group of bacteria.

I have had occasion, this past winter, to observe the examination of a considerable number of lungs of cattle that died, supposedly from the pectoral

form of septicemia hemorrhagica. In some of them *Bacterium bovissepticum* was present and in others it could not be found. This suggests the possibility that the lungs from which it was isolated were from cows that carried this organism in their upper air passages and that the primary cause of the disease from which they died may still be undetermined. The results such as those given in the paper are instructive and will be of much aid in the final analysis of this puzzling group of bacteria.

DR. C. D. MCGILVRAY (Toronto, Can.): I am inclined to favor the view expressed by Dr. Moore, that a diagnosis of hemorrhagic septicemia is probably not justified in so many instances. The prevailing tendency appears to be where doubt exists as to an exact diagnosis that hemorrhagic septicemia is the most acceptable. This seems to apply to some extent both to diagnosis in the field and in the laboratory.

BOVINE TUBERCULOSIS

Much has been said and written about the danger of bovine tuberculosis to man without much headway having been done to suppress the disease in cattle, and thus do away with that danger to man. But what is a very great menace to the health of children is the tuberculous dog and cat, which are very far from rare in this country. This danger is much more accentuated than bovine tuberculosis because the dog is mostly affected with the human type and the cat stands about midway. Just imagine people fondling and kissing cats and dogs with open tuberculosis. It is frequently done.

Not so many years ago the writer had brought to his notice a dog that belonged to a physician who was suffering from tuberculosis and his wife was dying from that malady. The physician and his veterinary surgeon complained that the animal had a painful disease of the rectum, which no doubt he had. But what struck the writer at once was the general tubercular expression of the creature, so much so that he declared the condition to be one of tuberculosis. A fortnight later the animal was destroyed and generalized tuberculosis was discovered on post mortem. Such an example could be multiplied again and again. As in France and elsewhere, the majority of dogs affected with tuberculosis belong to publicans and restaurant keepers.—HENRY GRAY, M. R. C. V. S., in *Veterinary Notes, Journal of State Medicine* (London).

A DISCUSSION OF THE FACTORS CONCERNED IN THE ETIOLOGY OF EQUINE INFLUENZA AND CONTAGIOUS PNEUMONIA¹

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Because of the confusion which has existed in the classification of the diseases incident to the shipment of animals of the equine genus, it will probably be well to preface my remarks by defining, briefly, influenza and contagious pneumonia as here considered.

We start first with the general term "shipping fever," a term which covers collectively that group of epizootic infections which are incident to the shipment of so-called "green" horses and mules. In this group we recognize three separate and distinct entities, namely, influenza, contagious pneumonia and strangles.

In influenza proper, we recognize an acute, febrile, systemic infection, characterized chiefly by catarrhal inflammation of the mucous membranes, and accompanied frequently with inflammatory swellings of the tendons, tendon-sheaths and subcutis.

Contagious pneumonia is that condition which has frequently been spoken of as the pectoral form of influenza. It manifests itself as a croupous or pleuro-pneumonia. That contagious pneumonia is a separate and distinct entity, apart from influenza, is now generally conceded by most investigators. This view is substantiated by the fact that a type of filterable virus has been proven the cause of influenza, whereas no such evidence is forthcoming in contagious pneumonia; and further, by the fact that animals recovering from true influenza possess a substantial immunity against further attacks of that disease but are still readily susceptible to contagious pneumonia. Conversely, horses which have suffered from contagious pneumonia are less susceptible to further attacks of such disease but are readily susceptible to influenza. Of course, it should be recognized that influenza and contagious pneumonia run hand in hand. Factors promoting one disease are equally favorable for the other. Thus

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the two diseases often occur simultaneously in the same group or stable of animals.

It is not necessary to say much about distemper or strangles; its identity as a separate entity, with *Streptococcus equi* (Schütz) as the etiological factor, is well established. I might mention in passing, however, that my remarks on the factors contributing towards influenza and contagious pneumonia, in general, apply equally to strangles.

ETIOLOGY OF INFLUENZA AND PNEUMONIA

Now as to the primary etiological factors concerned in influenza and contagious pneumonia. Back in 1882, Dieckerhoff demonstrated that influenza could be transmitted to susceptible animals by the intravenous and subcutaneous injection of warm blood from affected animals. Later Poels demonstrated the filterability of the virus by producing the disease in susceptible horses through the inoculation of Berkefeld-filtered semen from a stallion which was known to have infected mares which it had been permitted to serve. Subsequently, Poels produced the disease by the inoculation of Berkefeld-filtered blood-serum from a horse which had been artificially infected. Bacteriological examination of these virulent, filtered inoculums failed to give positive cultural results or to reveal visible organisms microscopically. Thus, the causative factor in equine influenza has been established as an ultramicroscopic, filterable virus. These results have been confirmed by a number of investigators.

As regards contagious pneumonia, I feel that all we can say regarding a specific etiological factor, is that, at present, the cause of the disease is not definitely known. Some time ago Gaffky and Luhrs demonstrated in the mononuclear cells in secretions from the air passages of horses in the early stages of contagious pneumonia, some rod-shaped or pyriform, protozoan-like bodies containing eosin-staining granules. They believed these cell inclusions to be the cause of the disease. Some support has been accorded the views of Gaffky and Luhrs by other investigators, including our own federal Bureau of Animal Industry, this latter institution observing these cell inclusions in specimens from several cases of contagious pneumonia occurring in a severe outbreak of the disease which originated at National Stock Yards, Ill., in 1913. While these findings are interesting, and may later prove significant, it cannot, at present, be stated that these cell bodies have been definitely shown to be the cause of equine contagious pneumonia.

We cannot pass from a consideration of specific factors in contagious pneumonia, without referring briefly to the fact that we have several types of bacteria associated with the disease which are of importance as secondary factors. Chief among these is the streptococcus, closely related to, if not identical with, the *Streptococcus equi*, the recognized cause of strangles. Schütz demonstrated this organism in the lungs of cases of contagious pneumonia. As he found it present in the tissue in pairs, he termed it "*Diplococcus pneumoniae*," and considered it the cause of the disease. It has been shown, however, that this so-called "diplococcus" of Schütz appears as such only in tissue lesions, while in exudates and in cultures it forms chains, thus establishing its identity as a streptococcus. It has been further shown that it is a secondary invader, rather than the true cause of the disease.

OTHER SECONDARY INVADERS

Another secondary factor of relative importance is *Bacillus bipolaris septicus* or *Pasteurella equiseptica*. This organism has, in the past, likewise been considered as the true cause of contagious pneumonia by several investigators. This bacillus is frequently found in the lungs of affected horses, associated with the streptococcus. It is also occasionally found in the blood and in the nasal secretion. Its role as a secondary factor, rather than the true cause of contagious pneumonia, has been well established.

Numerous other bacteria have been isolated and described from time to time by various workers in connection with contagious pneumonia. These include *Bact. coli*, *B. paratyphosus*, *Ps. pyocyaneus*, *Act. necrophorus*, staphylococci, pneumococci, etc.

There is just one other point to which I would like to call your attention, before leaving specific factors in the etiology of these diseases, and that is the fact that in influenza, we occasionally observe carriers, such as are met with in typhoid and diphtheria in the human family. The stallion, with whose semen Poels worked, while in apparent perfect health, continued to eliminate the influenza virus with his semen for months. Further, Basset demonstrated the blood of a horse which had recovered from an artificial inoculation, to be infectious three and one-half months subsequent to recovery. Other investigators have had similar experiences. Thus in considering factors concerned in the transmission of influenza, we have a carrier problem to reckon with.

To summarize now, our knowledge of specific etiological

factors concerned in equine influenza and contagious pneumonia: We find ourselves, on one hand, pointing to that great group of so-called filterable viruses for the cause of influenza, and in contagious pneumonia—omitting the bare possibility that the cell inclusions of Gaffky and Luhrs are the cause of the disease—we observe ourselves clinging to a number of secondary agents. It is indeed regrettable that we cannot break through that great barrier that stands between us and that vast field of filterable viruses. We pass a fluid through one of the several types of bacteria-retaining filters, find it culturally and microscopically sterile, yet infective, and it goes in the one big class of ultramicroscopic, filterable viruses. Here we must stop. We cannot hazard even a guess as to whether our infective agent is protozoan, bacterium or whatnot.

HUMAN INFLUENZA

I would like to digress here just a moment, to refer to the work of Olitsky and Gates, of the Rockefeller Institute, on human influenza. These investigators, back in 1918, isolated a minute, filter-passing anaerobe, which, after 4 years of investigation, they feel is the cause of human influenza. Whether or not later work by other investigators will confirm their conclusions, is a matter of speculation. However, the point I wish to make here is, that irrespective of whether or not such confirmation is forthcoming, they have made one, big, outstanding point, and that is, they have demonstrated conclusively that there exists in connection with influenza in man, a type of filter-passing, delicately-growing, strict anaerobe, which has heretofore been missed. In other words they have pointed to possibilities in a field which has been little explored. Because of the analogy which exists between human influenza and influenza of horses—and we might say canine distemper and possibly extend it to the so-called “flu” of hogs, recently described—I feel that investigations, directed along the lines indicated by the work of Olitsky and Gates, might bear fruit.

I now come to that part of my paper which I particularly wish to emphasize. We have discussed the specific etiology of influenza and contagious pneumonia and found that we are still in the dark regarding the subject. However, in connection with the incidence of these diseases there are some few things of which we are sure. We know, in the first place, that when we ship young western animals east, and country horses to the city, over our railroads, we have influenza and contagious pneumonia.

We know that with increased traffic in equine stock, such as existed during the days of the war, there is a tremendous increase in the number of cases of influenza and contagious pneumonia. We recognize that conditions incident to shipment are potent factors in the production of the disease. We have observed that energetic sanitary measures, coupled with such means as can be adopted to protect the animal against conditions which tend to lower its normal resistance, constitute the best we have to combat these maladies.

CONTRIBUTORY CAUSES

Let us, for a moment, consider briefly some of the conditions to which the horse and mule in transit are subjected. We see young, "green" horses being brought in from the country to an assembling point, and loaded 20 to 25 in stock cars on a siding. They are excited and nervous, so that by the time the train is actually ready to start on its trip, they are worked up to a "steaming sweat." In such condition they are whirled across the country at the rate of 25 to 50 miles per hour, often under the most adverse weather conditions. In some cases the shipment originates in a section of the country where mild weather is enjoyed. The animals leave such climate to ride through—a few hours later—sections in the throes of a winter blizzard. Then comes the frequent stops so characteristic of the freight train. This gives the animals a chance to recover from their first chill and again "steam up." Then the train pulls out and the chilling process is renewed. In the meantime any infection present in the cars, whether there originally or introduced by one or more animals in the shipment, finds ready victims.

Perhaps the journey is a long one. In such event the 28-hour law must be complied with, so the animals are loaded off in pens on a siding. These pens may be in poor sanitary condition and may have held an infected shipment just a short time prior to the arrival of our present consignment; there may be portions of contaminated forage left in them. Our animals in their state of weakened resistance, furnish fertile material for the activities of the influenza and contagious pneumonia organisms.

Then we must not forget the large city sales stables and stock-yards. They must be recognized as most potent factors in the spread of these diseases. Horses from all sections are shipped into these big centers, pass through the yards and sales stables, and are reshipped to other sections. In such movements infection is

brought in by some and taken out by others, thus keeping the virus well distributed all along the line.

During the latter part of 1917 reports reaching the office of the Surgeon General, indicated that equine influenza, contagious pneumonia and strangles, among Army animals, constituted by far the most serious problem with which the Veterinary Corps had to contend at that time. During October 1917, out of some 77,000 animals, there were approximately 12,000 admitted to sick report and 800 deaths, the vast percentage of these admissions and deaths being due to some type of shipping fever. At one time the losses from shipping fever were costing the Government over \$100,000 per week. I might cite you numerous additional data to stress the great importance of this problem to the Army, but I do not want to burden you with figures.

Aided by the federal Bureau of Animal Industry, steps were taken to keep all horse sections of stock yards, sales stables, collecting, feeding and watering points, and all stock cars used by contractors furnishing animals to the Government, properly cleaned and disinfected. Further, all remount depots were advised that unless they too maintained their premises in good sanitary condition and as free from infection as possible, measures taken elsewhere would, to a large extent, be nullified. Officers on purchasing boards were urged to exercise the greatest care possible to guard against purchasing animals in the incubative or early stages of the disease. It was also directed that precautions be taken to prevent the shipment of animals with elevated temperatures.

RESULTS OF DISINFECTION

That these efforts were fruitful is evidenced by the fact that weekly death reports for the four weeks in December 1917 and the first week in January 1918 showed a diminution in deaths as follows: .52%; .40%; .37%; .28% and .27%. These figures obtained in spite of the fact that the number of animals was constantly increasing. Further, weather conditions were less favorable during the latter part of this period than in the beginning.

It might be well at this point to recite some of the instructions given by the Surgeon General's Office to yard inspectors detailed to supervise these sanitary measures. They were instructed, in part, as follows:

"For the purpose of improving sanitary conditions at the point to which you have been assigned, in connection with yards and stables used in the purchase and forwarding of animals intended for public service, you should

insist upon all such yards and stables being placed immediately in good sanitary condition. Such disinfection as is necessary should be promptly carried out. The necessary labor and materials should be furnished by the railroad or stock company owning the yards. Any failure on the part of the owners to carry out your recommendations should be immediately reported to this office. The Quartermaster General has agreed to stop all shipments over railroads which fail to carry out the measures recommended.

"Stock pens are to be thoroughly cleaned by the railroad. This is to be followed by the application of a 3% solution of any disinfectant containing 50% cresylic acid. Low places are to be filled in with small stones, cinders or screenings. Stock cars, when ordered for loading, are to be thoroughly cleaned of all litter and manure, and inspected and put in safe condition for shipments, by the railroads. Cleaning and disinfecting of cars must be done by the railroads at way stations and points along the line other than remount depots and auxiliary remount depots. When cars are to be loaded at auxiliary remount or remount depots, the railroads are to furnish, at a proper charge, sufficient bedding, such as sawdust, cinders or sand, to be placed in the cars by the officer in charge after the veterinarian has satisfied himself that said cars have been properly cleaned and disinfected.

"The ground in infected corrals must be thoroughly scraped, and the scrapings removed to a safe location outside of the corrals. Strict attention should be given to quality of the forage, and forage left by outgoing shipments should be collected and burned. Water left by outgoing animals should be removed from all troughs and the troughs properly cleaned and disinfected."

Another point I might mention is, that early in the war it was held that the 28-hour law could not apply to the movement of Army animals. Consequently a number of animal shipments were sent through to their destination without unloading, in spite of the fact that the trip consumed more than 28 hours. Such action sent the sick and death rates soaring and soon resulted in orders for strict adherence to the 28-hour law.

I want to state that I have had the opportunity to look over the records and reports of the federal Bureau of Animal Industry, covering an extensive investigation which the Bureau conducted during the period 1916-1919. They had an inspector visit all of the principal horse markets of the country, trace shipments, and study shipping fever from the angle of transmission. These reports, which include statements from large shippers and dealers operating large sales stables, are practically unanimous in stating that losses from diseases, incident to the shipment of horses and mules, were materially reduced when measures to improve the sanitary condition of barns, sheds, pens, chutes, cars, etc., were carried out.

BIOLOGICAL THERAPY

I am asked to discuss the use of biological products in the control of influenza and contagious pneumonia. I had intended to omit any reference to this phase of the subject; first, because it was not germane to my topic, and secondly, because I did not want to be responsible for drawing out a discussion which almost invariably follows when this point is brought up. However, as a

question has been put to me, I will answer by saying, frankly, that in my opinion the results from serums, vaccines, bacterins, etc., in these diseases, have been disappointing. I do not feel that the incidence of equine influenza or contagious pneumonia has been lowered as a result of their use. Further, when it comes to the use of bacterins in the treatment of influenza and contagious pneumonia, I am absolutely opposed to such practice. There is no scientific basis for it; it is simply adding to the burden of an animal whose defensive forces are, at the time, being severely taxed to overcome an acute systemic disturbance. Then, we cannot disregard the fact that the use of something which may be looked upon as a specific by the practitioner, too often tends to impart a false sense of security and thus cause him to neglect measures which he might otherwise take to alleviate or prevent the disease.

I believe that if the attention, efforts and money expended on these factors, shown to be of secondary nature, were employed with a view to improving our knowledge of the primary agents concerned in these diseases, a more useful purpose would be served. We would at least be going at the problem from the proper angle. By these remarks, I do not want to give the impression that I am in any way opposed to biological therapy, or to the use of biologics in the prevention of disease, where the agents employed are of established value. Failure to take advantage of the biological product whose worth has been proven, is a refusal to utilize a powerful factor in the control and prevention of disease. Further, I am heartily in favor of giving new products, with scientific foundation, every possible chance of proving any merits which they might have. On the other hand, when various products have been used over a long period of time in connection with certain specific diseases, with no real definite results of a favorable nature, I would feel very loath to recommend continued use of same.

In concluding these remarks I wish again to emphasize that with our limited knowledge of specific etiological factors in influenza and contagious pneumonia, and in the absence of specific immunizing agents of definite value, measures tending to keep the infection along the line of transit at a minimum, and those which will tend to protect the animal against conditions which lower its normal resistance, promise more in the way of relief in these diseases than any other measures we might at present take.

SOME TROUBLES MET IN IMMUNIZING AGAINST HOG CHOLERA

By E. R. STEEL, D.V.M., *Grundy City, Iowa.*

(Continued from page 59, April Journal)

I do not like to use serum alone, except in suckling pigs, for serum-alone immunity is relative and may last from several days to several weeks in different individuals. If cholera exists in the herd, some of the animals, losing their temporary immunity early, pick up the infection from carriers and the disease will be dragged out over months as the hogs lose their temporary immunity and pick up the infection. Besides, to get an owner to handle hogs again is hard to do, and if the hogs get the flu again he has the same risk to run as before. By increasing the dosage of serum, to offset devitalizing influences, virus may be used with safety. To discriminate in the use of virus in sick herds, giving only serum to those running a fever is folly, for hogs run a fever with worms, pneumonia, ulcerative enteritis, flu, and from handling in warm weather. It is hard enough to pick cholera pigs in the laboratory with a daily temperature chart.

It is argued by some that temperatures should be taken to tell how extensively the infection exists in the herd. All that can be told by one temperature-taking is that sickness exists in the herd; not how extensive it is in every instance. I have given pigs, inoculated with virus, but not sick, and running a normal temperature, immense quantities of serum and have had them develop cholera within a few days in as large a percentage as the other virus pigs left without serum. It is doubtful if serum has any value in already-sick, cholera hogs and giving virus to them certainly won't make them sicker. The dosage of serum should be increased in the apparently well hogs, for in them we may head off the infection. Just how long after inoculating with virus it will do this, I have never heard reported. The pigs experimented with above had gone eight days. Of course, in the field, infection is generally not so uniform; but it may be if the pigs are all exposed at the same time. The prognosis should always be guarded.

The percentage of recoveries in sick hogs varies in different herds. Even giving virus alone to pigs, some of them will recover and sometimes many won't get sick at all. Hoskins¹³ reports:

"On the average it is safe to assume that about 14% of pigs weighing between 40 and 140 pounds have sufficient natural immunity to resist fatal infection with virulent virus."

Reading thermometers and handling syringes is rather poor hygiene, and trying to discriminate as to use of virus with one temperature-reading, may lead either to false hopes or to leaving many hogs with a temporary immunity which will break later, if exposed to cholera, and will thus lead to confusion, the operator thinking he has hemorrhagic septicemia, mixed infection, and other diseases that may be associated with cholera.

As regards administration, the practitioner should acquire a habit for careful work. A clean, dustless place to work, a sanitary place to keep hogs after vaccination for a few hours to allow needle-puncture holes to close, or a pasture free from mud holes to turn them into, should be insisted upon. Instruments should be boiled or otherwise sterilized after each job. I prefer boiling them. I like the axillary spaces to inject the serum, splitting the dose, and the ham for the virus, injecting it deeply intramuscular. As for the intraperitoneal injection of serum, I have not used it extensively because I think that the peritoneum can be infected more easily and the consequences are worse than in muscle, if infection should occur. For treating the point of injection, I use tincture of iodine, keeping a rubber finger-stall on my index finger that touches the skin. Feeding lightly after vaccination is important, for over-feeding certainly does influence pigs inoculated with virus; and a test may be thrown off with one over-feed.

As I have shown, the dose of serum should be regulated according to conditions, although I believe if the label dose were increased 10 cc on small pigs, we would have less post-vaccination troubles. On large animals the label dose could be cut with safety. With virus, I use 3 cc for small pigs and 5 cc for large ones, simply that I may not pass up some for want of absorption of enough of it, dosage of virus being only a question of whether the pig gets it or doesn't. Abscesses following vaccination are not necessary and are due either to contaminated serum or virus, or to contamination by the operator, generally the latter. The hurry of practice tends to make us careless, but the administration of serum and virus should be considered an operation and careful technic acquired by habit. Technic is something a farmer won't acquire, for even on farms where I vaccinate regularly twice a year, I find I have to insist that cleanliness be observed, and I believe that in handling serum and virus and syringes they would become just as careless. A veterinarian knows better and should live up to his professional training if he doesn't want his

work compared with that of farmers.

The handling of serum and virus and keeping a record is another item that should be considered. Serum and virus should be bought in quantities large enough to vaccinate at least three herds with the same serial, if the veterinarian has an outlet for it. Buying in test lots is a splendid way also, for each job is another test under field conditions. Then a record should be kept of every herd treated, even if only a few pigs. Some of the serum companies have record books they give away, which include the following points: Date of treatment, owner's name, number treated, average weight, number killed for diagnosis, number with high temperature, history of exposure, number sick when treated, number that died before treatment, kind of serum, serial number, amount used, kind of virus, serial number, amount used, additional treatment, and total charge.

Such a record will stand in court, and I have found it good in explaining troubles met incident to immunization. If temperatures are not taken in supposed-well herds, it will act as a check on the potency of the serum, for if one herd loses several pigs and the other herds given the same serial do not have losses, previous infection of some sort may be suspected. By keeping your own record, you do not have to depend on the serum company's statement that the serial of serum proved O. K. in other herds. It is a protection to the owner of the hogs, to the veterinarian doing the work, and to the serum company if unjustly criticized.

Another feature in handling serum and virus is the care it should receive. Within a few moments after they are withdrawn from the animal, serum and virus are chilled in ice water and are later kept in an ice-box until ready for distribution. They should be shipped then, in refrigerator cars, or otherwise packed and kept cool in going to distributing points. From there, if shipped over long routes and on the road many hours or a few days in transit, in hot weather, they should be packed in saw dust and ice, preferably with an ice-chamber in the center of a wooden box. After the veterinarian receives them, they should be placed in an ice-box or other sufficiently cool place. I use an ice-box in the late spring, during the summer and early fall, and my fruit-cellar in the winter, keeping a thermometer in them all the time and giving it occasional observation. An even temperature of 40 to 50 degrees F. is thus maintained. To keep an ice-box going that will hold 50,000 cc of serum and necessary virus, it has cost me \$32 during the last year. I have an ice-box also that I carry

in my car, which holds 12,000 cc of serum and necessary virus. By putting a chunk of ice in it the size of a double fist, it maintains a temperature of about 50 degrees F. all day in the summer. In the winter I put hot water in the ice compartment and I find it will maintain an even temperature of about 40 to 50 degrees at about zero atmospheric temperature, the exact temperature desired being regulated by cooling the water.

The advantages of this ice-box are evident. A surplus supply of serum and virus can be carried and kept at a uniform temperature, for it is hard to take just the exact amount required for a job. In the summer we often vaccinate all day. Large bottles of serum may be tapped to finish a job and the balance kept at refrigeration, although I prefer to get small bottles of the same serial for this purpose. Opened virus should be discarded, however, for it is very sensitive to contamination. Virus is much more delicate to handle than serum, especially clear serum. Heated to atmospheric temperature in the summer, it rapidly loses its virulence. If an ice-box is thought too cumbersome, a thermopack may be used for carrying unused serum and the virus. It is said they will keep ice cream from melting several hours. Although I have used one, I never checked one with a thermometer. Now these precautions may not be necessary, but I have maintained, why go to the bother of keeping serum and virus cool in the plant, and then have them exposed to all sorts of temperature conditions in the field?

Concerning the effect of freezing on serum and virus, Dr. M. Dorset wrote to me:

"My opinion is that freezing would not be likely to destroy the activity of the virus We have had occasion to freeze hog cholera serum solid and later test its protective properties and were not able to note any ill effects from the freezing."

He did not state how long after the freezing of the serum and virus they were tested, or if repeated or continuous freezing altered them. In practice, I think it would be well not to use serum or virus that had been frozen unless they could be used immediately. An even temperature is the main consideration and the temperature of the container should run from 35 to 55 degrees F. The careful handling of serum and virus impresses the farmer that they are products he has no business handling, which is absolutely true. Besides, the veterinarian is receiving a charge for handling serum and virus and I think he owes it to his client to handle them in the very best manner he knows how.

The part played by the potency of serum and the virulence of

virus cannot be overlooked in considering troubles met in immunization work. Are all brands of serum and virus of the same merit, taking U. S. inspection as a standard? Mohler¹⁴ writes:

"Again it is stated that 'serum producers have absolutely lost their individuality. They are making serum according to the man who reads about it in a book.' This statement is not in accordance with the facts. It is within the knowledge of the Bureau that practically all manufacturers have certain individual methods in use at their establishments. We do not make an effort to discourage individuality."

Practitioners and owners of live stock owe a great deal of appreciation to the government inspection of serum and virus; but it is well to understand the limitations of its protection. To use them from a company simply because they have passed inspection and to assume that, therefore, the potency and virulence cannot be questioned is a mistake. There are two things U. S. inspection does; namely:—It requires a uniform plan of production which has been shown for years to be successful, which prevents producers from going off on blind roads following notions as regards the general plan of production; second, it installs a careful sanitary police system, which requires cleanliness and sterilization and prevents the introduction of sick animals on the premises. With the veterinarian in charge of production, thereafter, lies the difference in the quality of the products. He is allowed discrimination as to the choice of his hypering virus, the choice of his virus-pigs, the picking of his hyperimmunes, the feeding of his virus-pigs, and he will often exact greater precautions as to contamination and purity of his products than the inspector requires.

Judgment and experience are assets, if he possesses them, and is not hampered in following them.

Personally, I think virus-pigs should not be taken from stock-yards, for they should be chosen with care from areas in which cholera does not exist or immunization has not been practiced; that hypering-virus should meet the same requirements that simultaneous virus does; that hyperimmunes should have been immunized at least 90 days and exposed to cholera either by injection or in feed-lots where cholera and other infections have been withstood; that the feeding of virus-pigs will influence their breaking and that they should be fed lightly to secure the most virulent virus. Regarding the test, too much importance must not be placed on it. That it can be tampered with, I am convinced. At best it is a trial on only a few pigs under ideal conditions and the real tests must come in the field.

As regards inspectors, they vary in judgment and ability, and

much must depend on the judgment, ability and conscientious scruples of the veterinarian in charge. Most serum companies are probably doing their best to turn out a product that will meet the approval of use in the field, for after all that is the check. That corners can not be cut, though, is not true. U. S. inspection is a help and guide in serum-and-virus-production, but it is not a guarantee that they are infallible or are even the same in potency or virulence. The practitioner must rely to a certain extent on his confidence in the producer, on investigation into the details of the methods of manufacture, and on results in the field, keeping a record himself.

Finally, the cost of immunization to the farmer is one of the serious contributing factors to the success or failure of immunization. It is evident that if we are to follow the plan I have outlined, the cost must vary with conditions. Contract vaccination should be discouraged. Immunization of little pigs, still suckling immune mothers, or having natal immunity, may be followed by less loss at time of vaccination, but the breaks later on may be increased. It is cheap at the time and that is what the farmer is looking for. Propaganda in the farm papers has led the hog-owner to lose confidence in the veterinarian in many instances and the practitioner who is trying to do his work the way he believes it should be done is charged with being high-priced. Veterinarians themselves have entered into competition, in some instances, to see how cheap vaccination can be made to satisfy the farmer.

If we are to place the immunization of hogs on a purely commercial basis, loose methods of production and administration will be encouraged. Competition may be the life of trade, but in dealing with a contagious disease it is dangerous. An understanding between the hog-owners and veterinarians is essential if confidence is to be restored and the immunization against hog cholera placed on a sound, successful basis. It should be evident also that farmer-vaccination can not be recommended, for the farmer is not qualified by virtue of training and experience to do such work. The things I have pointed out in regard to immunization can not be mastered in ten minutes or learned in a two-day course in a country school house. The veterinarian is essential to the live-stock industry and the live-stock industry is essential to successful farming; so the sooner the farmer and practitioners come to understand each other, the better it will be for everybody concerned.

SUMMARY

1. I do not believe immunization of suckling pigs is safe, as a routine practice.
2. The proper age to vaccinate is after weaning, and when pigs are in good condition.
3. Wormy pigs may be treated for worms at time of immunization, but they should be treated before, if possible, so pigs will be in a thrifty condition.
4. Pigs with ulcerative enteritis should not be vaccinated as a routine practice, but if cholera is suspected, they may be given the double treatment with increased dosage of serum.
5. Pneumonia or swine plague should be considered as often secondary to hog cholera, and cholera should be eliminated as a primary factor.
6. Hogs with flu, if cholera is suspected, or if they are exposed to cholera, may be given the simultaneous treatment, if dosage of serum is increased.
7. Serum-alone treatment in sick herds or individuals should be avoided, unless the simultaneous treatment is administered soon afterwards.
8. A careful technic of administration should be mastered and acquired as a habit by veterinarians.
9. Serum and virus should be handled in the field the same as they are in the laboratory, and a record should be kept of each herd treated.
10. U. S. inspection is a guide to producers, but it is not a guarantee to the user that serum and virus so produced are uniform as to merit.
11. Cost of immunization may influence the character of work done.

CONCLUSION

I offer these opinions simply as my observations, made, it is true, in a rather desultory manner. More experimental work on immunization is needed and the practitioner welcomes and appreciates greatly any light that may be thrown on his problems in the field. However, such work must meet the exacting requirements of practice to be of the highest value. The practitioner must stick to known, generally accepted methods of immunization. Laboratory experiments should be complete and not fragmentary, and checked by other investigators and well confirmed before being turned over to farmers and practitioners as conclusive.

With other hog diseases to confuse us, we must keep straight on cholera, if we are to avoid or handle troubles met, either following closely or a long time after immunization.

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HOW DOGS WIN THEIR RIBBONS

Are you perfectly familiar with the system of awarding the ribbons in the different classes at dog shows? The following may serve as a guide.

BLUE—Awarded to the winner of a class.

RED—Awarded to second best dog.

YELLOW—Awarded to third dog.

WHITE—Called "Reserve Prize" and given to the dog placing fourth.

PURPLE—Called "Winners" ribbon and awarded to the dog taking first in the winners class. In this class the winners of all other classes compete. Dogs winning purple ribbons alone are given championship points.

PURPLE AND WHITE—Called "Reserve Winners" ribbon and given to the dog taking second place in the winners class. If the dog placed first happens to be disqualified the reserve winner is elevated to winners.

GREEN—Called "Special" ribbon and awarded to dogs winning special prizes of various descriptions, offered separately for the majority of breeds.

COLIBACILLOSIS OF CATS¹

By H. F. DAILEY

Angell Memorial Hospital, Boston, Mass.

I have chosen, for several reasons, "Colibacillosis of Cats" as a subject to discuss at this Conference. First, during the past eight years, the small animal department of the Angell Memorial Hospital, of Boston, has handled over 19,000 cat patients. Of this number, about 14% were affected with colibacillosis when entered, and 8% developed this condition while under medical or surgical treatment at the Hospital. These figures alone demonstrate the frequency with which this disease occurs in handling the feline branch of a small animal practice.

Secondly; in the December issue of the JOURNAL OF THE AMERICAN VETERINARY MEDICAL ASSOCIATION, a discussion, following the reading of a paper by Dr. O. V. Brumley, at the 59th annual meeting of the A. V. M. A., on gastro-enteritis in small animals, brought forth this condition, and from the large number of members entering into this discussion I am led to believe that many others in the profession have encountered difficulty with this disease, just as we have, and therefore may welcome a report of our investigations and findings.

Practically no information of value can be secured concerning this condition from literature dealing with diseases of small animals. Most of these works mention this disease under the heading of "Infectious Gastritis," "Infectious Enteritis," or "Croupous Enteritis of Cats." All describe the symptoms and pathological findings, but dismiss the disease abruptly with a statement to the effect that it runs a rapid course, usually terminates fatally, and treatment as a rule is unsatisfactory.

The first, thorough investigation of this disease, from a pathological standpoint, was made by Dr. Karl F. Meyer, at the University of Pennsylvania Veterinary Department, during 1911 and 1912. His findings indicated that a virulent type of the colon bacillus was the causative factor, and from these findings the disease received the name of "colibacillosis." Since that time, moreover, various investigations have borne out this contention.

Working from a purely clinical standpoint, with the patho-

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logical findings and symptoms presented as our leads, we spent over two years attempting to combat this condition with most rigid kennel hygiene and all the medicinal agents indicated. Our results during this period were absolutely disastrous. Our next step was to try and produce the disease by artificial and natural inoculation. Here again we met with reverses. Cats kept in an uninfected environment seemed to contract the disease even more readily than cats kept in contaminated cages, and fed on food containing cultures of the colon bacillus isolated from cats dying of this disease, or food mixed with vomitus or feces from affected cats. Results here were negative.

Before proceeding any further with our investigations, we collected all possible data on the activity of the colon bacillus pertaining to human medicine. After carefully studying this collection we were impressed with the fact that many research workers had found very positive evidence that in toxemic conditions terminating fatally, the colon bacillus took advantage of the rapid decrease in the vitality of the host, and invaded the circulation and viscera adjacent to the digestive tract.

PREDISPOSING FACTORS

With these findings as a lead we started a thorough, daily investigation of all cats in the hospital. We were not long in discovering that confining a cat to a cage in an unaccustomed environment had a rather surprising effect upon the animal's normal functions. Over 40% of the cats, immediately upon being placed in a hospital cage, sought a secluded corner and remained in that place without drinking, eating, urinating or defecating for a period of from 18 to 48 hours. These cats, examined after 24 hours of this inactivity, disclosed a greatly distended bladder and hard masses of feces in the large intestine extending from the caecum to the anus.

Cats requiring a surgical operation were not usually operated upon until the day following their admission to the hospital. Following the operation they would re-enter this period of inactivity and with this period added to the first 24 hours you can readily understand why operative cases are more prone to develop this disease. If these conditions were permitted to continue past the 48th hour period, we noticed that the cats developed a frequently repeated, swallowing motion of the muscles of deglutition. This symptom continued from 12 to 18 hours before actual emesis occurred.

To determine whether the urinary and intestinal stasis shared equally as factors in this condition, we ran through a set of tests, first catheterizing several cats which had retained urine for 36 hours, being careful not to disturb the collection of feces in the large intestine. This urine was tested for acetone and diacetic acid, but was negative. These tests were made to discover the possible presence of acidosis. After the urine had been removed, the majority of these cats continued to present the intestinal stasis and subsequently developed the colibacillosis in true form.

We next took several cats which showed urinary and intestinal stasis after a 36-hour period and carefully emptied the large intestine by enemas. We found that many of these cats urinated during the process, or shortly after. Therefore, we considered the urinary stasis of no further consequence. Following the removal of the collection of feces in the large intestine, many of the cats became active and accepted food with favorable results.

INTESTINAL STASIS

Working with intestinal stasis as a lead, we took several cats, which were accustomed to cage confinement, and were thriving after two weeks of such confinement. On these cats we tried various diets. First we fed all the milk they would consume for four days. No changes occurred in their condition. After a few days of regular diet, we put them on an exclusive and excessive diet of raw beef. No change occurred. We next used as a diet boiled beef, but the cats ate sparingly and did well. On raw liver the cats did well. On cooked liver two cats out of eight developed colibacillosis, while the remaining six showed some degree of intestinal stasis.

We added two strong recruits to our string, and after six days on a mixed diet, fed a mixture of canned salmon and well-boiled haddock, giving the cats all they would eat, and they ate with relish. After three days on this diet two cats showed symptoms of colibacillosis and at the end of the fifth day five out of the eight had developed it.

We next performed several ante-mortem "autopsies." Placing the cats under chloroform anesthesia, we opened the abdominal cavity and found that a retroperistaltic wave started in the small intestine, 12 to 16 inches from the pyloric opening, and forced small quantities of the contents of the small intestine through the pylorus into the stomach. Thus we were able to account for the bile-stained, alkaline vomitus which occurs in

this condition. Beyond the origin of these retroperistaltic waves the small intestine showed a space of 6 to 8 inches, in which all peristalsis had ceased. The intestine in this area presented a hard, cord-like appearance, pale in color. Beyond this very feeble peristalsis could be detected, proceeding toward the large intestine. Our findings in this instance are borne out by the physiological law governing intestinal peristalsis, to the effect that any condition interfering with the normal function of peristalsis, for example, severe constipation, will cause a reverse action and the development of retroperistalsis.

HISTORY

To account for the seemingly epidemic outbreaks of colibacillosis which appear from time to time, affecting cats in certain localities, under normal conditions, we collected detailed histories of such cases, and our findings were as follows; These outbreaks are associated with abnormal, climatic conditions, occurring either during the summer, when such localities are experiencing a period of very rainy or humid weather, or in the winter, during a period of heavy snow-fall. Under either condition cats become very inactive, refuse to go into the open, but continue to accept their normal rations and spend the intervening hours curled up in some comfortable corner. The result produced is an intestinal stasis and an outbreak of colibacillosis. Where several cats in one household are affected at the same time, it can, without exception, be traced to faulty feeding, usually in the form of excess canned salmon, boiled fish or liver.

Therefore we have come to the conclusion that colibacillosis of cats is not an infectious disease, but rather starting with an intestinal stasis which develops into a toxemia, thus lowering the vitality to a point where the colon bacillus takes advantage of existing conditions, and invades the circulation and surrounding tissues.

As factors in the etiology of this condition, we enumerate the following: Placing cats in unaccustomed surroundings, injudicious feeding, abnormal climatic conditions, and intestinal obstructions caused by accumulations of hair or intestinal parasites.

SYMPTOMS

The symptoms presented, in order of appearance, are: A sphinx-like attitude, constipation, repeated, labored, swallowing motions of the muscles of deglutition, and drawn expression about

the eyes. Emesis, first, of particles of undigested food, followed by white, frothy mucus, which gradually changes in color to a yellowish, later a greenish, and finally a greenish-brown. This vomitus frequently contains ascarids which have been forced into the stomach by the retroperistalsis. There is a rapid and very apparent loss of weight, with extreme weakness, and the cat emits a peculiar, high-pitched cry, especially when handled. The animal seeks a cold floor to lie upon, will lie with the head hanging over a dish of water, and as the end approaches, try to get into the dish. This desire frequently leads the cat to sink, bathtub, or pan used for draining a refrigerator, in which they attempt to lie. The fur loses the usual luster, no longer lies smoothly against the body, but stands up, giving the cat a very unkempt and forlorn appearance. The temperature at the onset is slightly elevated, but soon becomes subnormal. After the disease has been in progress for 24 hours a diarrhoea develops, and the stools then consist of a grayish mucus. From here on the cat becomes rapidly weaker, the extremities become cold and the skin has a putty-like feeling. Symptoms of abdominal pain appear, the cat becomes restless, throwing itself first on one side then on the other, stretching the legs apart and unsheathing the claws. As the end approaches we notice marked muscular twitching, especially about the head and neck. A state of coma soon follows, which is of short duration. The course in fatal cases of colibacillosis is usually rapid, two to four days, depending upon the age and vitality of the subject.

PATHOLOGICAL FINDINGS

The most noticeable pathological changes appear in the gastro-intestinal tract. The mucous membrane of the pharynx shows evidence of an acute, inflammatory process. The gastric mucous membrane appears pale in color, swollen, and covered with a tenacious, yellowish mucus. The contents of the intestines vary from a salmon-pink to a grayish-brown, watery mucus. The mucous membrane of the upper third of the small intestine is swollen and pale pink in color. Beyond this, for a distance of 6 to 8 inches, the mucous membrane is light gray and the remaining portion is of a cherry-red color. Peyer's patches appear swollen and red. Areas of petechial hemorrhage appear throughout the whole intestinal tract. The musculature is infiltrated and of a dark red color, the serous covering being greatly thickened. The mesenteric lymph-glands are enlarged and edema-

tous. The liver, spleen and kidneys show evidence of an acute, parenchymatous degeneration.

TREATMENT

If the cat is under the direct observation of a veterinarian, at the onset of this disease, such as a hospital patient, we have found that the most efficient treatment consists in the immediate administration of $\frac{1}{16}$ grain of arecoline hydrobromide. However, if emesis has occurred for a longer period than eight hours, this treatment is prohibitive, as the rapid lowering of vitality makes the cat susceptible to this drug and he will succumb to its effects.

The next line of treatment consists of high enemas of warm, normal saline solution, followed by the oral administration of two drams of castor oil or four drams of mineral oil. This will usually be retained if the cat is immediately placed in quiet surroundings and left unmolested. If the oil is rejected repeat the dose immediately. Never under any circumstances let the owner carry the cat any distance after the oil has been given or it will be rejected.

If the cat has vomited a large number of ascarids we precede the oil with tenth-grain santonin and calomel tablets, every 15 minutes until five have been given, or a capsule of carbon tetrachloride, 2 minims per pound of cat. Antiemetics are contra-indicated. We have tried them all and find that they are rejected almost immediately. The forced administration of nourishment in any form is fatal. Even after emesis has ceased, for a period of eight or ten hours, forced feeding will prove fatal, as such nourishment is retained in the stomach and after several hours the accumulated amount, from repeatedly-given, small quantities, will be rejected and severe attacks of emesis will follow, terminating fatally.

ADMINISTRATION OF MEDICINE TO CATS

At this point I wish to say a few words regarding the administration of medicine to cats. The person giving the medicine is the only one required for this operation. The addition of human units, of from one to a dozen, only adds difficulty in corresponding proportions. Place the cat on a table with a smooth surface. Have the medicine to be given on a convenient corner of this table. Get the confidence of the cat by a few gentle strokes of the hand or scratch it gently about the head and neck with the index finger. Then place the palm of the left hand over the top of the head and press the cheeks gently inward against the upper

premolars, with the index finger and thumb, at the same time raising the head slightly. Watch to see that both front paws are firmly planted on the table. If one paw is raised, lower the head and relax pressure on the cheek.

It is a peculiar fact that cats never strike with a clean sweep of the front paws, but rather accomplish this feat in two phases. The first phase is a warning. The paw is raised to a position where it is in line with the ventral surface of the chest. If the hold on the cat's head is slackened during this phase the cat immediately replaces the paw on the table. This action may have to be repeated two or three times before the cat permits the medicine to be given. The action of the index finger and thumb, pressing the cheeks against the teeth, forces the cat to open the mouth slightly. If the medicine to be given is liquid, pour a thin stream onto the end of the tongue very slowly. Relax your pressure from time to time and permit the cat to swallow. If tablets are to be given, drop them as far back on the tongue as possible and tap the under side of the throat with the index finger of the right hand and the tablet will be swallowed immediately.

To proceed with the treatment. After emesis has ceased for a period of 12 hours, a small amount of warm milk or broth may be offered. Allow this to remain before the cat for 30 minutes. Frequently the cat will lap a small amount. This procedure may be repeated every four hours during the next 16 hours, at the end of which period the cat will become active and move about in search of more substantial food. As a rule, this should consist of lean, raw beef given in small quantities, at five-hour intervals. During the period of convalescence it is often advisable to give a tablet consisting of iron, quinine and strychnine 1-500 grain. If the cat does not show a marked desire for food, we have found that 3 grains of pepsin, given every four hours, will create the desired results. If treatment is started during the first 24 hours of this disease the prognosis is favorable.

VISITORS AT THE JOURNAL OFFICE

Recent visitors at the JOURNAL office include: Drs. Earl Sunderville, of Ithaca, N. Y.; H. F. Leighton, of Pontiac, Mich; E. W. Porter, of Reynoldsburg, Ohio; S. Brenton, E. P. Schaffter, H. H. Sparhawk, John Hoberg, C. E. Turnbull, H. T. Carpenter, E. E. Patterson, Z. Veldhuis and Frank J. Fess, all of Detroit; and Mr. F. V. Hawkins, of Pitman-Moore Co., Indianapolis, Ind.

THE CORPUS LUTEUM¹

By H. E. KINGMAN,

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The veterinary profession has a just right to be proud of the progress that has been made in the treatment of sterility in cattle. Information regarding this subject has become general and the context so broad that one finds it necessary to confine one's remarks to certain, well-defined phases. Phenomenal results have been obtained through manipulations of the corpus luteum and it is about this body that I propose to speak.

In many respects clinical results have been obtained that may be difficult of accurate explanation. We have resorted frequently to extirpation of the corpus luteum, when there seemed to be nothing else to do and the cow has conceived. This is satisfactory enough, but the practice demands a more thorough understanding of the principles involved.

We are forced to admit that we have worked blindly with our manipulations of the corpus luteum. "The cart has preceded the horse," in many respects, but gradually new light is being thrown upon the subject and through a better understanding we will be able to handle our cases more intelligently and successfully.

It is not necessary to take your time with a dry description of the physical properties of the corpus luteum and the manner in which it is formed. This information may be obtained from any anatomy or physiology. The phase in which we are most interested is relative to its influence upon the healthy and diseased genital tract. It becomes necessary, however, to undertake a general discussion of the theories that attempt to explain the activities of the corpus luteum.

Its active principle is thought to be an autocoid of a simpler chemical formula than some of the other incretions. Further, it may elaborate more than one. Excitatory autocoids are called "hormones" and inhibiting autocoids are known as "chalones." The corpus luteum seems to possess both hormones and chalones. Since we may point directly to stimulating effects, such as growth

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of mammary gland, and inhibiting action, such as the anestrus, or absence of "heat."

The corpus luteum may also act in a simple, mechanical way. By inhibiting ovulation, and the functions incident to ovulation, it may act as a foreign body in the ovary. When the corpus luteum is extirpated, the ovary is relieved of its presence, and may then throw into the circulation one or more autocoids of its own production. This theory is probably not true but deserves consideration. Further, we are confused regarding the method by which the results are obtained through the expression of the corpus luteum, since following its extirpation it is dropped into the peritoneal cavity, and from there absorbed into the circulation, acting in the same manner as if it had been injected intravenously. We must not lose sight of the fact that the incisions of the body are closely related, and that the placenta, mammary gland and pituitary body are adjuvants to the corpus luteum.

EXPERIMENTAL EVIDENCE

Let us now consider the evidence regarding the corpus luteum, as obtained from the results of experimentation and the field of practice.

1. The corpus luteum, when injected intravenously, stimulates uterine contractions. (Shafer and Stagaki).
2. It stimulates the growth of the mammary glands and the outpouring of milk, even in the virgin female, when injected subcutaneously. (McLeod).
3. It is responsible for the raised nutrition of the uterus during pregnancy. (Marshall).
4. So long as it remains full-sized and *in situ*, it inhibits ovulation and estrus.
5. If the corpus luteum is pressed out of the ovary, estrus occurs in three to five days, in the cow.
6. Following extirpation of the corpus luteum, the cervix dilates and the uterus contracts. (DeVine).
7. Its absorption from the ovary is not governed by any fixed rule, although normally in the cow it atrophies sufficiently to permit ovulation every 21 days, unless fertilization of the ovum takes place.
8. The factors which cause its retention in non-pregnant cows are not well understood.
9. Its retention permits a period of rest for the uterus.

Perhaps, also, idleness permits accumulation of pus and lowered vitality and resistance on the part of the uterus.

10. It is subject to cystic degeneration.

11. It is subject to hypertrophy.

It is now our problem to correlate this information and make practical application of it.

1st. Through the extirpation of the corpus luteum, ovulation and estrum are produced. We have frequently found cows that had shown no apparent estrum for a period of 6 or 8 months or longer, and have been able to produce it within five days by expressing the corpus luteum. Of all the results obtained from this operation, the production of heat is probably the most phenomenal as well as successful.

2nd. As a result of the contractions of the uterus, produced by the expression of the corpus luteum, the organ may be emptied of its contents, whether the latter be fetus or pus. If one is called upon to produce abortion in the cow, the most satisfactory way is through expression of the corpus luteum. This must be done, however, within the first four or five months of pregnancy, and the earlier the better, after 30 to 60 days of gestation. We may take for example a registered, Jersey heifer that has accidentally been served by a Holstein bull. One should wait 30 to 60 days, to make certain that the heifer has become pregnant, and further to allow the corpus luteum to become well established. It must be carefully handled and completely expressed.

THE TREATMENT OF PYOMETRA

In case of pyometra, the extirpation of the corpus luteum constitutes part of routine treatment. It is first advisable to liberate the pus from the uterus, depending upon the corpus luteum to bring about involution and reparative processes. A new corpus luteum will not be formed until ovulation takes place, along with estrum and menstruation. If recovery has not taken place at this time, the new corpus luteum may be expressed, repeating the flushing and invigorating process of menstruation. This of course is done in conjunction with other forms of treatment, but probably constitutes the most important factor.

The question immediately arises: When are we justified in expressing the corpus luteum and how may we determine whether or not it is abnormal? So far as macroscopic appearance is concerned, we are unable to differentiate between true and

false and retained corpora lutea. It becomes necessary to take into consideration the history of the case. Naturally one should proceed with caution, since the expression of a corpus luteum in the early stages of pregnancy would surely defeat the end toward which the operator is working. So, the diagnosis of pregnancy becomes an important matter.

One would derive little benefit, if any, by destroying the corpus luteum of estrum, since if a sterile cow comes in heat regularly, one must look to some other cause than abnormal corpus luteum. However, if the cow does not come in heat, then one may conclude that the corpus luteum is "persistent," and after making certain that the cow is not pregnant, it may be expressed.

The corpus luteum is subject to cystic degeneration. One may usually detect the presence of a cyst through the walls of the rectum, but they may be so small that palpation would reveal nothing. Dr. Williams assumes a rather unhopeful attitude in regard to cystic corpora lutea in that he believes that they are caused by the infection of the crater left by the ruptured graafian follicles and from which the corpus luteum develops. This infection travels by continuity through the uterus and fallopian tube, and by contiguity to the open crater.

Some would differ from Dr. Williams, however, in regard to the method of handling cystic corpora lutea. While his contention that the cause of sterility may be looked for in the fallopian tubes or uterus is absolutely tenable, it is also true that the extirpation of the corpus luteum brings about a reaction in the entire genital tract that simulates inflammation, increasing the resistance toward invaders through increased phagacytosis and the attraction of antibodies and serum in the uterus.

Menstruation is spoken of as a surgical freshening of the uterus, and estrum is recognized as a period of repair. This to me constitutes the most plausible explanation for the good results that are obtained from the expulsion of the corpus luteum.

THE USE OF GLANDULAR EXTRACTS

We have not yet learned to use the corpus luteum or placental extracts in veterinary practice, although physicians are using both for a variety of diseases. From the literature on the therapeutic use of these extracts in human practice, the indications are that there is still much to be learned, although rather marvelous results are being realized under the present knowledge. One of the largest firms preparing corpus luteum recommends it

for use in the following conditions: Abortion (threatened and recurring), aene, dysmenorrhea, neurasthenia, orchitis, obesity, ovarian insufficiency, vomiting in pregnancy, prurigo.

Sterility is the cause of enormous loss to stock-raisers and they will greatly appreciate the successful handling of this problem that has for so long a time baffled all efforts toward control. We have only begun our work with the organs of internal secretion. Most of us can remember when alkaloidal therapy made its debut. Endocrinology is now crying for recognition. We are now using the active principles of many of the endocrine glands, including adrenalin, thyroïdin and pituitrin, and preparations of the ovary and placenta.

Perhaps we will be using even preparations of the corpus luteum with the same sound intelligence with which we now use adrenalin and pituitrin, but before that time comes there will be many enthusiastic supporters of this and that product, and then the stern old teacher, Experience, will retard the pendulum and start it back toward normalcy and the sane use of endocrines.

The veterinarian is struggling with the subject of sterility and marked progress has been made. We have derived encouraging results from the manipulations of the ovary. Our understanding of the real factors involved is indeed meager. It is to be hoped that we will proceed with caution and make careful, painstaking observations in order that the handling of this subject of sterility may develop to a stage that will be a credit to the profession.

BOY, PAGE DOCTOR HALL

Our United States Government has actually issued letters patent for a tape-worm trap, according to a recent press dispatch. The patentee describes his rather unusual and ingenious contrivance as follows:

"My invention consists of a trap which is baited, attached to a string, and swallowed by the patient after a fast of suitable duration to make the worm hungry.

"The worm seizes the bait and its head is caught in the trap, which is then withdrawn from the patient's stomach by the string which has been left hanging from the mouth, dragging after it the whole length of the worm."

The trap may be made of either gold or platinum, according to the press notice. We might suggest that if it were set with a few diamonds, Mrs. Taenia would undoubtedly be more easily captured.

CLINICAL OBSERVATIONS ON SILAGE POISONING¹

By J. J. OBERST,

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This case report is based upon the writer's experience in treating horses affected with so-called silage poisoning on one farm where there were seven horses, six of which succumbed to the disease. Other names which have been given to this affection are mycotic gastro-enteritis, forage poisoning and botulism.

The silage was a mixture of mature corn and third-growth alfalfa, which had been harvested into the silo during a spell of wet weather. One load of alfalfa was used to about every three or four loads of the corn. Upon inspecting the silage in the concrete silo it was found to be moist and well packed and showed no indication whatever of mold, even around the edges.

When the owner was questioned, he stated that it had been his custom to feed the horses, the first thing in the morning, about one-half peck, or a little more (1 bushel for the 7 head), of silage which had been forked out of the silo the night before. This meant that the silage had been exposed to the air for from 13 to sometimes 15 hours. In the evening the same quantity of silage was fed, after having been uncovered for 7 to 8 hours. Between these feeding-periods alfalfa hay and hominy feed was given. This ration had been fed for a period of about two months without causing digestive disturbances of any kind.

Just at the time the trouble started, the weather was very warm for March, so it may have been responsible for bacterial changes occurring in the exposed silage. At any rate the owner had noticed during this time a misty formation rising and maintaining itself from the top of the silage, to a height of some 18 to 20 inches. When the weather was cold this mist had not been observed.

On March 9th I was called to the farm. Upon arrival, about one-half hour after being called, I found horse Number 1 gasping his last. He was perspiring in patches, eyes turning and twitching in their sockets, heart fluttering at the rate of about 140 per minute. This horse died without the least struggle, within less than two minutes after my arrival. Being wanted at a

¹Presented before the semi-annual meeting of the Wisconsin Veterinary Medical Assn., Marinette, Wis., July, 1922.

few other places in a hurry, I did not make any inquiry as to feed- and water-supply, and left for the next place.

March 11th a hurry call was received, saying that horse Number 2 was appearing sick, but was still eating. When I arrived one-half hour later, I found the horse perspiring in patches, and trembling so violently that he could not maintain the standing posture, which he tried his best to do. The following symptoms were observed: Pulse intermittent and weak; pupils widely dilated; muco-purulent discharge from right nostril; complete inability to swallow; muscles of deglutition wasted away, the throat appearing as if tightly pinched-in from both sides, down to the upper one-third of the neck. No objectionable odor was noticed in this, nor in case Number 1. Case Number 2 died within 8 hours after the first symptoms had been noticed by the owner.

HISTORY AND SYMPTOMS

I then inquired into the feed- and water-supply, with the result as stated regarding the feed. The water is obtained from a 65-foot, drilled well, from which the home is also supplied. I immediately suspected the cause to be in the silage, and diagnosed the trouble as forage- or silage-poisoning. I ordered the feeding of silage discontinued immediately. This latter precaution proved superfluous at this time, however, since inspection of the 5 remaining horses showed all of them to be affected, none of them being able to eat and swallow any more. The symptoms which they showed were: Inability to swallow either liquids or solids was almost complete, except in Number 6, which at times seemed to succeed a little. When the tongue was drawn from the mouth, the animal could not retract it again, except Number 6. There was a constant flow of saliva. The animals would grasp the hay with their lips, but could not get it between the teeth. They would keep trying, until the hay became soaked with saliva, when they would drop it and pick up some dry hay. When attempting to masticate, the teeth could not be heard to come in contact with one another. When trying to drink, their lips would pucker a little, but not the slightest movement could be noticed at the throat. The muscles of deglutition rapidly wasted, presenting a pinched-in appearance around the throat and both sides of the upper third of the neck.

A muco-purulent discharge from the right nostril was noticed in every case, being slight at the onset and becoming more

profuse as the malady progressed. The pupils were slightly dilated and non-responsive to light. The animals, however, were attentive to surroundings in the beginning of the attack, but as the disease progressed, the hearing also appeared to become affected. Pulse-rate normal, but lacking tone. Temperature normal to slightly ($\frac{1}{4}$ to $\frac{1}{2}$ of a degree) sub-normal. Tail limp, muscles offering no resistance, so that one could almost fold the tail straight over the back like a rag. When the animals were walked, slight incoordination was noted, especially when being turned around.

The bowels were constipated and auscultation revealed only slight murmurs, and the latter only at irregular intervals. No tympanites was present in any of the cases. When the horses were in a recumbent position, a sharp, heavy needle could be stuck through the coronet without producing a reflex, except in Number 6, which showed slight sensation at this point. The symptoms increased in intensity, the pupils becoming more and more dilated. Weakness increased so that the animals could not maintain a standing position, but would lie quiet for hours at a time. The discharge from the nose increased somewhat, and the odor from mouth became offensive. Coma was at first partial then complete. There was irregularity of the heart, a faint gasp for breath, as the heart gave out, then the end. Six of the seven horses died with symptoms as described, the duration of the attack lasting from 2 to 120 hours from the time the first symptoms were noticed.

TREATMENT

The treatment attempted was as follows: Cases Numbers 4, 5 and 6 were given an aloetic physic in capsule, which could be seen to go down. Immediately afterward cases 4, 5 and 6 were given, with a long-nozzle dose-syringe (giving not more than 1 oz. at a time and watching for it to go down—a very tedious procedure), the following prescription:

R. Potassii permanganatis	gr. xv
Alumini sulphatis	gr. xv
Aquae	q. s. Oi

About 1 hour later, each received 1 quart of liquid petrolatum administered in the same manner. An hour after this, $\frac{1}{2}$ gr. of arecolin was administered, supplemented by about three gallons of normal, salt solution *per rectum*, in each of the above cases, the object sought being to unload the bowels. However, no results

were secured. Another $\frac{1}{2}$ gr. of arecolin was given two hours later without effect. I ordered botulinus antitoxin (Jen-Sal) and received the latter on the 13th, in the afternoon, and proceeded to inject same in doses of 40 mils, as prescribed. Cases Numbers 4, 5 and 6 were on their feet when the first dose of antitoxin was administered. Number 7 was down, unable to rise, but I gave him a dose. However, he died 8 hours after. Twenty-four hours after this, it was noticed that Numbers 4 and 5 were sinking and becoming more and more comatose, with the urine flowing away involuntarily. I decided not to waste any more of the antitoxin on them.

I then gave Number Six 60-mil doses every 24 hours, for 4 consecutive days, without observing any change in symptoms, although the antitoxin was absorbed very readily and completely. I now commenced the administration of nuclein solution (Abbott) subcutaneously every 4 hours, and after 48 hours of nuclein treatment, the animal seemed to be improved slightly, being able to swallow a little. The reason I used nuclein solution was because of its reputed action upon the white and red blood-corpuscles.

POST-MORTEM LESIONS

The post-mortem examination revealed the following lesions upon a hurried inspection: Small areas of congestion were observed upon both the large and small intestines, the latter showing black patches under the serous coat, from $\frac{1}{2}$ to $\frac{3}{4}$ inch in diameter. These were in places only, other portions appearing practically normal. The liver and kidneys were dark, brownish-red in color. Contents of bowels soft. The lungs were dark in places. The pericardial sac contained about $2\frac{1}{2}$ quarts of a reddish-colored liquid, partially gelatinous. Heart-muscle dark, showing a few petechiae similar to those observed in hog cholera. Tongue coated thickly with a greyish, soap-like substance, which when scraped off left the organ clean without evidence of other disease. Particles of food were found lodged in the throat, which together with decomposition of the buccal secretions, I think were responsible for the offensive odor, which is noticed in the later stages of this disease.

Samples of the silage, hominy feed and hay mentioned, as well as of the wheat and oats fed to the poultry on the farm, were forwarded to the Veterinary Science Laboratory, at the University of Wisconsin, for examination. The report received

from the Laboratory stated that attempts to demonstrate the presence of botulinus toxin by inoculating guinea pigs with a filtered extract of some of the silage and by seeding media to detect the presence of the botulinus organism were not successful. This is not at all surprising, as the sample forwarded was secured several days after the horses became affected, so it did not represent the particular lot of silage that made the horses sick.

Other interesting facts, mentioned in the report, were credited to Graham¹ who states that the toxin appears to be developed and elaborated on grain and forage stored in barns or silos, during certain seasons of the year, when temperature and natural conditions are favorable for the growth of the botulinus organism. It further appears that favorable conditions, i. e., anaerobiosis, are created for its growth and development upon animal feeds during the time of storage *en masse* in open fields. Anaerobic conditions naturally provided in storage feed evidently are not essential for the multiplication of botulinus-like organisms, or for toxin production, since growth *in vitro* is accompanied by the characteristic toxin formation under aerobic conditions in association with saprophytic bacteria, yeasts, or molds which may utilize the available oxygen or exert other favorable influences in their symbiotic development. This observation does not exclude the danger of botulinus intoxication from pasture feeding, though it does not establish the relation or occurrence of this disease in grazing animals.

According to Dr. F. B. Hadley, Wisconsin Experiment Station Veterinarian, silage is not a suitable feed for horses for the following reasons: (1) Because it has been shown that *Cl. botulinum* is more likely to occur in silage than in any other animal feed. (2) Because horses are very susceptible to botulinus toxin. (3) Because it is impossible to detect the presence of the toxin by an inspection of the feed, since the latter is not changed in physical appearance and molds have nothing to do with it.

Shelf bottles of cod-liver oil should never be refilled until the bottle has first been thoroughly cleansed and dried. Or, better, buy the product in pint containers and discard them after use.

¹University of Illinois, Extension Circular number 38, Forage Poisoning, by Robert Graham

POULTRY PROBLEMS¹

By E. L. STUBBS

Pennsylvania State Bureau of Animal Industry

Veterinarians must realize the importance of the poultry industry, which in value is second only to the dairy industry, so far as livestock is concerned, and which contributes so much to the food supply of so large a number of people. The productivity of the domestic fowl is greater than that of any other species, in proportion to their value. The value of the yearly products of a flock of poultry may be many times the original cost of that flock. Fowls are so often kept as a side issue that they are universally neglected. There is no other form of animal life that suffers more from the ravages of disease than fowls.

The general pathology of birds is not well understood and little is known of their tissue reactions to injury. Their resistance to ordinary wound infections differs strikingly from that of mammals.

The true scientist seeks and accepts truth at whatever cost. The true veterinary scientist sees his largest duty, and in the best sense his largest self-interest, in the prevention of animal diseases. Hence it falls upon veterinarians to take the leadership in anything that has to do with prevention, control and eradication of poultry diseases. Advice concerning sanitation, wholesome feeding and safe breeding is also very essential.

The poultry flock, as well as the dairy herd, or any other branch of agriculture, must be given detailed study and care to be successful. The poultry flock is built on the basis of egg-production, as the dairy herd is built on the basis of milk-production. Production is gotten by body capacity, because body capacity is necessary to accomodate reproductive organs, and egg production is necessarily a reproductive function.

Health is a fundamental necessity because only the healthy reproduce satisfactorily and profitably. Healthy birds must be started right and kept growing from the time hatched until maturity. Investigation of unhealthy birds very often traces back to a period of unthriftiness at some time.

In preventing disease, as well as maintaining the health of the flock, well-drained soil is necessary, so that the presence of mud

¹Presented at the fortieth annual meeting of the Pennsylvania State Veterinary Medical Association, Harrisburg, Pa., Jan. 23 and 24, 1923.

and moisture is lessened. A wet soil favors parasites. The continued use of a given area of soil for poultry, year after year, results in its becoming heavily infested with the eggs of various parasites and disease-producing organisms, consequently a greater source of danger to each succeeding generation. Therefore it is highly desirable that chickens be not kept on the same soil year after year.

The frequency with which poultry houses must be cleaned and disinfected should be borne in mind, when they are being constructed. Anything that will interfere with the free access of a man to any part of the house, should be avoided, because it will interfere with routine cleaning. The habit displayed by mites, of collecting in cracks and crevices, should be recognized, by providing buildings with a minimum of such places where vermin may collect. Nest boxes, perches and similar fittings should not be permanently attached, so that they can be easily cleaned. Certain details of construction will at least constitute impediments to the dissemination of parasites and infective material from bird to bird.

Chickens are very susceptible to dampness and draughts. Sanitary houses must be well ventilated and should be arranged so that sunlight penetrates to all parts. Moisture of three kinds must be considered; atmospheric and condensation, which can be controlled by ventilation, and soil, which can be controlled by a proper floor. If poultry houses are well ventilated and dry, the cold does not bother the fowls.

Proper and palatable rations are necessary for the maintenance of health and for the requirements of high production. Improper rations have a bad effect upon a bird just the same as upon an animal, and may lower vitality enough, to be a contributing factor in disease. Investigation of diseased fowls shows a large number affected with an inflammation of the intestinal tract and we cannot help but feel that feeding conditions are responsible for much disease.

Prevention of disease is absolutely necessary because once disease becomes established it is very difficult to handle and often puts the poultryman out of business, or at least stops the profits. Where disease does break out and measures for treatment are undertaken, it is very unsatisfactory, because of the very nature of the problem. In treating other animals, the unit of treatment is the individual, while in treating poultry, the unit is usually the flock, and measures must be taken to treat the entire flock.

In a flock, say of one hundred birds, the procedure is usually to mix one hundred times the amount of medicine for one bird with the food or water. It is clear that this is a very crude method of medication, because some of the birds will get little or none and others will get more than their share. Moreover it will be the sick birds, whose vigor has been destroyed, and whose appetite is gone, that will get little or none of the remedy, yet they are the ones most in need of it.

Proper husbandry will probably do more to prevent disease than anything else. Next to proper husbandry a knowledge of the cause and transmission of common poultry diseases is necessary. Chicken-pox and roup are both diseases of the head, but one is due to a specific cause while the other is due to improper husbandry.

Rapidly fatal diseases such as botulism, so called "limberneck" and coccidiosis, are intestinal infections, feeding infections, and can be prevented by not allowing access to infected material. In the case of "limberneck," elimination from the food of any material likely to contain the toxin of *Cl. botulinum*, such as spoiled canned goods or decomposing animal or vegetable matter. In the case of coccidiosis, keep the young chickens away from infested places. In our work at the laboratory we are finding a large number of chickens heavily infested with parasites, mostly roundworms and tapeworms. Infested birds and infested premises are the greatest sources of danger in the transmission of parasites.

The efficiency of the poultry house and surroundings as a healthy place in which to keep poultry is measured by the percentage of birds diseased. The efficiency of the fowls in the flock as a whole is measured by their natural powers of resistance to disease and of their natural strength, vitality and vigor. Until the poultryman realizes that he must start in the first place with healthy birds and must use every endeavor to keep them healthy, disease will be a constant menace.

The progressive veterinarian can well be surprised at the interest which the live stock owner and the public is giving the poultry industry. Those who have prepared themselves to render a service to poultry owners will readily testify that poultry practice offers a field of unlimited possibilities from a financial standpoint as well as from satisfaction of work performed for economic good.

The farm flock during the past year has been one of the few farming operations which has given a return above the investment. Pure-bred flocks are becoming quite common and birds of high value are often found. More effort is being spent on poultry and greater care is being given all kinds of poultry. When a practitioner demonstrates his ability to give advice concerning poultry, he renders a service which is appreciated by all members of the family and one from which he can likely get more free advertising of a favorable kind than from any other line of work.

Many veterinarians do not feel capable of rendering a service in poultry work, and are reluctant to accept calls. Yet if we stop to think, we will well realize that veterinarians are trained in the knowledge of disease and in methods of handling disease, so that we are better qualified to render such a service than anyone else. Furthermore when a veterinarian starts practice, he accepts the responsibility of treating disease, and it is his duty to respond to calls and use every effort to do the best he possibly can.

In conclusion, let us remember the following points:

We must realize the magnitude, the productiveness and usefulness of the poultry industry.

The susceptibility of poultry to disease makes disease a constant menace.

The poultry industry is built on the basis of egg-production, which is necessarily a reproductive function, and only the healthy reproduce satisfactorily and profitably.

Careful and proper husbandry will do more to prevent disease than anything else and is also essential in controlling or eradicating disease.

Prevention of disease is better than treatment, which of necessity becomes a flock proposition, hence a crude method and not so satisfactory as treatment of other animals, where the individual is the unit.

Poultry practice offers a field of unlimited possibilities, financially as well as from an economic standpoint.

Service in poultry problems is appreciated by the public as well as the poultry owner.

Veterinarians should accept the leadership in anything which

has to do with the prevention, control and eradication of disease in this rapidly growing industry.

Every veterinarian owes it to himself and to his profession, so that he can accept his responsibilities and opportunities, as well as to the public whose influence and confidence he must have, to become acquainted with poultry problems, in order that a service can be rendered to this important industry.

GLANDERS

The eradication of glanders from these islands is within easy reach, if not yet fully accomplished. Probably for more than a thousand years this disease has been with us, perhaps introduced by the Romans, but thanks to the discovery of mallein and its diagnostic use by two Russian veterinary surgeons, the last of it is in sight.

In 1907, when a new Glanders Order was introduced but did not take effect until January 1, 1908, there were fewer than 854 outbreaks, affecting 1,921 horses, in Great Britain.

During 1922 only four outbreaks were recorded.

CANINE PYORRHOEA AND SANITATION

Every dog kept as a household pet or companion, fed on soft food more than once in 24 hours and not given an opportunity to use his teeth, by the time he arrives at middle age, is the subject of pyorrhoea, so much so that in the majority of cases the pockets around his teeth are nothing more than so many miniature cesspools. To the bearers they often occasion gastric and other troubles, and to the inmates of the household, if they are not injurious, they must be very objectionable.

The trouble is never seen, even in very old dogs, that have been forced to use their teeth for reducing their food or in hunting rabbits and rats.—HENRY GRAY, M. R. C. V. S., in *Veterinary Notes, Journal of State Medicine (London)*.

PARASITIC INFESTATION OF DOGS BEFORE BIRTH¹

J. E. SHILLINGER, *Biochemic Division*, and E. B. CRAM, *Zoological Division, Bureau of Animal Industry, U. S. Department of Agriculture.*

Prenatal infestation with parasitic worms has been reported in a considerable number of cases and these cases involve parasites belonging to such dissimilar groups as the Nematoda, Cestoda and Trematoda.

With regard to flukes, intrauterine infestation has been reported by Fujinami and Nakamura (1911) for *Schistosomum japonicum* in dogs and by Narabayashi (1914) for the same parasite in the dog, guinea pig and human infant, in the last case the eggs of the parasite having been found in the feces of 3 of 22 new-born infants in Japan.

Similar cases of hydatid infestation in young infants have been reported by several writers: Cruveilhier reported a hydatid cyst in the liver of a child 12 days old; Heyfelder, 44 hydatids of the placenta and umbilical cord of a 7 months fetus; Hemmer, a cyst in the abdomen of a new-born child. However, concerning these and other similar reports, Dévé (1918) expresses doubt and thinks them probably *not* Echinococcus cysts but fetal malformations.

With regard to nematodes, Howard (1917) found hookworm eggs in the feces of a child 14 days old, in British Guiana; Adler and Clark (1922) found *Ancylostoma caninum* in 6 out of 13 dogs 2 to 15 days old; Ackert and Payne (1923) found mature *Necator suillus* in 7 pigs 26 days old, and since at least six weeks is necessary for the development of mature worms of this species after infection, these are undoubtedly cases of prenatal infection. Neveu-Lemaire (1921) found the sheep lungworm, *Dictyocaulus filaria* in a 4 days old lamb and in a lamb fetus. Large numbers of mature ascarids were found by Macfie (1922) in a 3 weeks old calf, and by Griffiths (1922) in calves dying the tenth to fourteenth day after birth. Fülleborn (1921) produced prenatal infestation of pups by injecting under the skin of a pregnant bitch thousands of *Belascaris* larvae obtained from the liver of a guinea pig which had been fed eggs of these worms.

The present experiment was carried out as an attempt to throw

¹Contribution from the Zoological Division, Bureau of Animal Industry, U. S. Department of Agriculture.

some light on the many cases met with in veterinary practice of *Belascaris* infestation of very young pups. It differed from Fülleborn's experiment in the method of inoculation of the bitch, as we endeavored in this case to produce the infestation in a manner as nearly as possible like that occurring under natural conditions, i. e., by the ingestion of infective eggs. In our work seven mature female ascarids of the species *Belascaris marginata* were procured post mortem from the intestines of two dogs. The gravid uteri of these worms were dissected out and the eggs removed and kept in a two per cent formalin solution at ordinary room temperature for a week. Examination of the eggs at this time showed them to contain live larvae. The next day a quantity of the fluid containing many eggs was administered orally to a bitch in advanced pregnancy. Two days later another supply was given. Eight days after the first feeding 12 puppies were born, 8 being dead at birth or dying shortly afterward, and the remaining 4 dying the following day. All appeared well developed and showed no apparent abnormality. Pressed sections were prepared of the fresh tissue of the liver, spleen, kidneys and lungs of the pups. Eight of the 12 pups showed infestation with larval *Belascaris*, 6 having them in the liver only, 1 in the lungs only, and 1 in both liver and lungs. All of the larvae found were between 900 and 950 microns in length.

While examination did not show any in the enteric canal, the position and stage of development of those found in the other parts of the body account for the mature worms reported by various writers from very young animals.

That the larvae undoubtedly reached the placenta through the maternal blood stream is shown by previous investigations in the migration of this and of related species. Ransom and Cram (1921) traced the migration of *Ascaris lumbricoides* and found the blood stream to be the principal route. Ransom and Foster (1920) obtained *Belascaris marginata* from the lungs of a rat to which they had fed the eggs. Fülleborn (1921) has found a wide distribution of *Belascaris* larvae throughout the body of dogs, encysted larvae being found in liver, kidney, muscles and brain. It is to be expected that their method of migration is similar to that of *Ascaris lumbricoides*.

It is difficult to judge what part the heavy *Belascaris* infestation played in the still births and the deaths soon after birth, as certain physical surroundings (weather, etc.) were unfavorable to young life at that time. It seems quite probable, however,

that the infestation may have been a factor in this case. It is evident that all of the larvae found were present as a result of the feeding of the embryonated eggs, as the bitch used in this experiment (dog 424 of Hall and Shillinger, 1923) had been given huge doses of an anthelmintic (240 cc and 320 cc of carbon tetrachlorid) about 11 months previously, and had been kept for observation on a cement floor free from contamination since that time. This animal died 16 days after the first feeding of ascarid eggs and 8 days after giving birth to the pups. Post-mortem examination showed no worms in the intestine but encysted larvae were found on the exterior of the right side of the heart and in the lungs. These larvae were apparently dead and had not developed as had those in the pups, being only 300 to 360 microns in length.

This work confirms Fülleborn's findings as to the possibility of prenatal infestation with *Belascaris marginata*, and establishes the fact that following ingestion of infective *Belascaris* eggs by pregnant animals, the larvae in the course of their migration may cross the placenta and enter the young in utero.

The results obtained may help to explain the high infant mortality in dog life and be of practical value in developing prophylactic measures for the control of these worms. It is evident that the protection of pregnant dogs from ascarids is a measure of importance in protecting pups from infestation with these worms. This fact has received little or no attention heretofore.

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VETERINARIANS OPPOSE LEGISLATION

Among the Michigan Veterinarians who were at the hearing on the Farmer Vaccination Bill, before the House Agricultural Committee of the Michigan Legislature, at Lansing, April 4, 1923, were the following: Drs. W. N. Armstrong (Ont. '94), of Concord; F. M. Blatchford (Ont. '93), of Brighton; A. B. Curtice (Ont. '11), of Hillsdale; H. M. Gohn (Ont. '93), of St. Johns; E. T. Hallman (Ala. P. I. '10), of East Lansing; A. McKercher (Ont. '93), of Lansing; R. A. Runnells (Mich. '94), of East Lansing; E. B. Cavell (Ont. '06), of Northville; Judson Black (Ont. '94), of Lansing; J. E. Wurm (Ont. '02), of Pigeon; representing the Michigan State Veterinary Medical Association; B. J. Killham (McK '12), representing the State Department of Agriculture; F. W. Chamberlain (Corn. '06), representing the Veterinary Division of the Michigan Agriculture College; and H. Preston Hoskins (U. P. '10), representing the American Veterinary Medical Association.

A PRELIMINARY REPORT ON SOME WORK DONE WITH A DIPLOBACILLUS ISOLATED FROM FOUR CASES OF PERIODIC OPHTHALMIA IN HORSES

By G. E. JORGENSEN

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Inasmuch as the etiology of periodic ophthalmia in horses has not been definitely established, a preliminary report of the findings of the present writer may be of sufficient interest to merit publication.

Over a period of six years, seventeen cases of periodic ophthalmia have been presented for treatment. Inasmuch as this abstract has for its purpose the discussion of the etiology and structural changes only, the treatment will be omitted. In only four cases out of the seventeen was anything definite found. The bacteriological findings in all four cases being identical, the description following will be general in character and include all four instances, without tabulation of the findings in each individual case.

Smears from swabbings and intracorneal aspirations showed the presence of a short, thick, rod-shaped, Gram-negative, non-motile, non-sporogenous, non-encapsulated organism, occurring in pairs as well as singly. Attempts at culturing were successful only in media containing blood or serum. On solidified blood-serum there appeared, after twenty-four to thirty-six hours, small indentations due to liquefaction of the medium. Later the medium was more or less completely liquified. The organism presented the biological features of the Morax-Axenfeld bacillus and was differentiated from the other members of the paratrophic or hemoglobinophilic group.

It was not possible to obtain an animal of the equine genus for experimental purposes here, hence no data are at hand regarding the pathogenicity of this organism toward the horse. Instillations of a pure culture into the eyes of a calf gave negative results. Four rabbits each received 0.5 cc of a pure culture intracorneally. Three showed no lesions whatever after six days. One developed an acute keratitis and iritis, taking on more of the characteristics of a panophthalmitis as the condition progressed. Examination of the eye of this rabbit, after hardening, imbedding and sectioning, showed the usual retrograde

changes common in acute, infectious inflammations. The organism was demonstrated in the lymph spaces of the cornea, in the canal of Schlemm, and in the papillary body, but could not be demonstrated in sections of the outer coats of the eye, the lens or conjunctiva. Numerous organisms were found in the aqueous humor in combination with leucocytes and fibrin.

In the most recent and fourth case in a horse, opportunity was given for studying the lesion in the eye of this animal, inasmuch as the owner destroyed the animal after the second attack appeared. Sections of the eye showed to a great extent a set of lesions similar to those seen in the rabbit. There was considerable infiltration of the cornea with leucocytes and fibroblasts. No organisms were found in the cornea. Sections of the iris, papillary body and tunica vasculosa (choroid) showed as intense hemorrhagic infiltration, with considerable fibrin present. Retrograde changes were present in stages from fatty and granular degeneration to necrosis.

No organisms could be found in these sections. Sections of the conjunctiva and tunica sclerotica showed a similar picture as did the choroid coat. Only in the aqueous humor could the organisms be readily found. No sections were made of the lens and inasmuch as the writer does not consider himself familiar enough with the normal histology of the retina to recognize lesions there, unless they were of the most prominent form, and such being not present, nothing can be said regarding the retina.

It was observed that in the leucocyte infiltration, both in the rabbit and the horse studied, there was a preponderance of polymorphonuclear and mononuclear leucocytes, with perhaps greater numbers of the mononuclear type than the polynuclears. Another peculiar feature noted was the absence of organisms in sections of the eye of the horse, while they were present in some of the sections of the eye of the rabbit.

SUMMARY

In four out of the seventeen cases of periodic ophthalmia in horses, an organism showing the cultural and morphological characteristics of the Morax-Axenfeld organism was isolated. No attempts were made to produce the disease artificially in horses, but in one rabbit out of four receiving intracorneal injections of pure cultures of the organism isolated from equine cases, there developed an acute kerato-iritis, progressing later into a general panophthalmitis. Instillations into the eye of a

calf gave negative results. Study of the retrograde changes in this disease showed the usual structural changes common to infectious inflammations.

CONCLUSIONS

The work here has been entirely too limited in its scope to permit one to arrive at a safe conclusion. It is obvious, however, that the presence of this organism may be of sufficient significance to merit further study. Although Morax, in his communication, claims that the bacillus described by him was non-pathogenic to animals, sufficient evidence is at hand to show that it is.

REFERENCES:

- Buchanan's Bacteriology.
- Delafield and Prudden's Pathology.
- Jordan's Bacteriology.
- Zeigler's General Pathology.
- DeSchweinitz' Diseases of the Eye.
- Morax. Ann. Past. Instit.

FROM CZECHOSLOVAKIA

Dr. Bohoslav Sykora, of Prague, Czechoslovakia, a graduate of the Veterinary College in Vienna, Austria, with the class of 1915, is spending three weeks in the Department of Veterinary Science of the University of Wisconsin. He is studying under a fellowship grant from the International Health Board which is largely financed by the Rockefeller Foundation. Dr. Sykora is preparing himself to fill a position in the Ministry of Health in Czechoslovakia in connection with the control and inspection of food products, particularly those derived from farm animals.

According to Dr. Sykora, his country is at present in much better circumstances than any in Europe. This is shown by her being the first to repay the war loan from the United States, and is accounted for from the fact that agriculture is highly developed and prosperous. Czechoslovakia has wonderfully fertile soil and raises enough agricultural products to support the population. The chief exports of the country are: sugar, Bohemian glass, coal and iron. Another noteworthy fact is that less than one-half of one per cent of the population is illiterate. This augurs well for the future of this new republic that has been modeled very closely after ours.

WHY THIS APPARENT INERTIA IN OUR PROFESSION?

By A. A. MOTLEY, Alpena, Mich.

Human medicine today is enjoying the greatest success in its history. Veterinary medicine is at the lowest mark. These facts must be obvious to even the slightest observer, and naturally the question arises, WHY?

Many theories have been advanced, chief among these as to the cause of veterinary medicine's decline, has been the automobile, while others blame the passing of the private school, interference of the State Department, county agents, pharmaceutical houses selling to the laity, and every other element that some individual seems to think has interfered with his particular problem, and each one, I have noticed, treats the case as it applies to him, when it seems to me that we should think of the profession as a whole and each man try to recognize what a small part one individual is generally able to play, either in its success or failure.

Having been in active practice for over twenty years and for eleven years of that time in a city of fifty thousand, the first years during which an automobile was a curiosity and the driving horse was "king," I feel somewhat competent to judge what harm the automobile has done to the veterinary profession, and after considering the question from many angles, I recognize the automobile as a friend to our profession, a very good friend in fact, and not an enemy as so many seem to think. Neither do I recognize any of the other causes mentioned above as being great factors in the cause of the decline in veterinary practice.

There are dozens of fields open to the veterinarian today that were not considered twenty years ago, some of them easier and more profitable to handle than horse practice was. One thing that was lost with the driving horse was the advertising the veterinarian got through people who were always around horses and therefore became familiar with the veterinarian's work. Today boys are growing up in the cities under a different atmosphere, around some garage or "engineer for a Lizzie." Many boys and their families own animals of different kinds and have work for the veterinarian, but think, in some cases, that the profession has gone out of business.

I consider the veterinary profession as a whole does not

receive half enough publicity and as a result the public is becoming ignorant of the large field of service covered by veterinary medicine. Do not misunderstand me, I do not mean that each individual practitioner should start an advertising campaign in his community by printed ads., etc., as this would, in my opinion, be of little value. It is a problem of the veterinary profession as a whole, speaking through their schools, state and national societies, Bureau of Animal Industry, state and city veterinary officials, etc. There must be a mutual friendship and understanding between the county agricultural agent and the veterinary profession, as the county agent can and should be made one of the best advertising mediums the veterinary profession can have. The county agent as a whole is rendering good service and they are here to stay. The fact that their work, in some instances, seems to run parallel to ours is the very best reason why our profession should cooperate in place of quarreling.

Our A. V. M. A. should do some work at each annual meeting that would be of national interest to the public and have it broadcasted through the press to the end that the public may know what the profession is trying to do for the public welfare and by so doing, enlighten the people as to the many different kinds of service our profession is able to render. More money must be expended in research work and the result made known to the public. We should always be mindful that our popularity and financial compensation, in fact, our very existence as a profession, will be determined in proportion to our ability to serve. There is little possibility today for a business or profession to grow and prosper unless it is receiving constant publicity as to the services they are rendering.

The profession of human medicine is at its height today, due to the publicity it is receiving in regards as to what it can do. In my home city, a city of fifteen thousand population, school nurses, visiting and county nurses, are all educating the public as to the possibilities of medical and dental service, and besides, they have free clinics for tuberculosis, crippled children, babies, etc., and all of these have been leading factors in placing human medicine where it stands today, besides the untold good these agencies are doing the people by educating them as to when they should have medical aid.

You would be surprised to learn, if you were to inquire of your friends, how few people know that it is a veterinarian who

inspects the meat in our large packing houses. What a wonderful opportunity lost, to keep the profession before the public! What a help if the inspector's stamp gave his initials, the words, "Inspected" and "Veterinarian." Many times I have noticed an article in the press by some state official, a member of our profession, and signed by him, but failing to make it known what his profession is. Of course, members of the profession may recognize him by his signature, but the general public never knows that the profession played any part in the work he is talking about.

Too much cannot be said of veterinarians in private practice taking active part in civic affairs, as members of Rotary Clubs, Boards of Commerce, Agriculture Societies, etc. Every professional man is his profession's representative in his community and that community seldom judges a profession any better than its local representatives.

Individual advertising such as advertising that you vaccinate hogs, etc., is of little value. The profession as a whole must be advertised by giving publicity to its advancements. Then the individual practitioner need not worry. If he is competent, he will receive his full share of the public's confidence and business.

Pouring from the back of stock bottles prevents staining of the labels.

Chloroform is superior to alcohol for powdering camphor. Less of it is required and it evaporates faster.

Corks may be rendered impervious to extremely volatile liquids by soaking them in a 2½-percent solution of gelatin containing 5 percent of glycerin, then dipping in a solution of tannic acid.

The teacher in the primary department of a Philadelphia school had been talking for some time about the three grand divisions of nature—the animal, the vegetable, and the mineral. When she had finished she put the question: "Who can tell me what the highest form of animal life is?" The pupil nearest her hastened to supply the answer as follows: "The giraffe."—*Rural Zip*.

FARM PRODUCTS SHOW DEMONSTRATES A DEMAND THE VETERINARY PROFESSION MUST MEET

By JOHN H. WINSTANLEY, H. A. MILO and W. J. MARTIN,
Pennsylvania Bureau of Animal Industry.

The exhibition by the Bureau of Animal Industry of the Pennsylvania Department of Agriculture, of specimens of transmissible diseases of live stock and poultry throughout the State, serves as an educational measure to all and a means of correcting false impressions. It demonstrates to live stock owners and poultrymen the large number of destructive, transmissible diseases which may devastate or depreciate the value of their herds and flocks. Specimens exhibited and demonstrations at county fairs have always attracted a large number of persons interested in live stock from the producers' standpoint. Smaller county fairs depend on this exhibit as a special outstanding feature.

The transmissible diseases affecting poultry never were so well demonstrated in Pennsylvania as they were at the Farm Products Show, at Harrisburg, during the week of January 21, 1923. Besides pathological specimens of transmissible diseases, parasites and the tuberculin reaction in chickens were exhibited each day of the show. The reactions were supplemented by the display of tuberculous lesions in freshly-killed, tuberculous chickens. Large crowds gathered around these specimens, indicating a keen interest of poultry producers in the transmissible diseases with which poultry may become infected. This should awaken in the veterinary profession the necessity of more interest and a more extended study of poultry diseases.

The magnitude of the poultry industry can be estimated from the following:

The 1919 census shows that the value of the annual production of chickens and eggs in the United States is \$1,047,989,919. Pennsylvania ranks fifth in the value of chickens and eggs produced in United States; the five leading states, including Pennsylvania, produce approximately one-fourth, having a value of \$250,000,000; Pennsylvania and the six bordering states produce one-fifth, having a value of \$200,000,000.

The veterinarian *must* become more interested in poultry problems. It was quite apparent from questions asked at the

Farm Products Show that poultrymen want service from those who understand the essential nature of diseases and the body changes caused by them. Already inroads into the poultry-disease problems, which the veterinary profession is best qualified to handle, have been made by feed and drug companies and other agencies which have readily responded to the poultryman's call. Poultrymen should not be compelled to seek help with reference to disease from other than those who are properly trained and qualified to give proper advice.

Some veterinarians who have become successful in giving advice on the various diseases of poultry attribute their success to careful post-mortem examinations, usually performed in their offices; a knowledge of the most common causative agencies of poultry diseases, and an understanding of the economic importance of the most serious and frequent group of diseases which may affect the flock. One who is informed on the diseases of poultry gradually creeps into the hearts of the farm family.

Every successful business is dependent to a large degree upon the advice of specialists. There is rightfully a proportionate share of the money, incidental to such a productive business as the poultry industry, due the veterinarian provided he is qualified to give the proper kind of advice, which in turn will justify him in receiving it. Furthermore this advice would leave a larger percentage of profit to the poultry owner. The monetary returns to feed and drug concerns interested in poultry must be large, as they make an elaborate display of their products at most county fairs and agricultural exhibits, in order to bring these products before the poultrymen.

Poultrymen are aware that success in the industry is largely due to close observation of the flocks, sanitary measures and the prevention of disease. The local veterinarian who is always more or less in close touch with the owners and breeders of poultry and their flocks, is in a position to give the kind of advice needed in the prevention and treatment of diseases. He should become interested in poultry problems and save poultrymen from the expenditure of considerable sums of money in the purchase of proprietary remedies and useless products. He should direct his client in the purchase of things beneficial and having a tendency toward an economical production.

CASTOR POMICE POISONING

By S. R. JOHNSON,

Bureau of Laboratories, Michigan Department of Health

In presenting this subject it is not the writer's intention to discredit or condemn castor-oil pomice as a feed, but to bring before the profession some of the symptoms, anatomical changes, and tests for the presence of the toxic principle, ricin. In addition it might be well to call attention to the danger of feeding such feed before determining if the toxic principle has been destroyed.

Poisoning and death due to ricin, the toxalbumin of the castor-oil bean, was encountered among some sheep to which the castor-oil-bean pomice (castor bean after the oil has been removed) was being fed.

Castor pomice is often used as a feed and is considered to be a fair substitute for some of the oil meals, as it has a laxative action and contains some nutrient material. The pomice is obtained from the bean after the castor oil has been expressed by the cold press method. This removes only the oil, leaving the toxalbumin in the pomice. This poisonous substance may be destroyed by heating to a boiling point from one to two hours. Drying and exposure to the air for six to eight hours is thought to be sufficient, but it has been my experience that this is not very certain, for unless the pomice is spread out very thin the action of the air will not destroy the toxin.

A sample of pomice over a year old, which has been held in a cardboard box, perfectly dry, still remains toxic to laboratory animals when fed to them in small quantities or a saline extract injected subcutaneously.

Symptoms which develop during a case of ricin poisoning are weakness, vomiting, retching, bloody diarrhea, and impaired vision. Death is caused by the destruction of the erythrocytes and general toxic effect.

Behring states that it is possible to produce an antitoxin against the ricin toxin and experimental animals may be immunized against the toxalbumin by feeding small amounts of the castor-oil bean. Immunity may be produced by repeated injections of small amounts of ricin subcutaneously. The amount to be fed must be regulated according to the amount of the

toxalbumin present in the pomice. It has been found that 0.2 cc of a saline extract made from a sample of pomice, and injected subcutaneously into a full grown rabbit, will cause death in less than 24 hours. This toxic principle would appear to be cumulative from feeding experiments conducted with rabbits as test animals.

In animals dead from ricin poisoning, the appearance of hemorrhagic gastro-enteritis, ulcers in the stomach and intestines, nephritis of the diffuse type, and in general an engorgement of all blood vessels, firm clotting of the blood, marked congestion of the lungs and, in some cases, edema have been present.

The toxalbumin may be detected serologically by the production of an antiserum. The precipitation test and the complement fixation test have proved to be very delicate for detecting the presence of ricin. Hemagglutination tests are also very delicate, but ordinary bean meal may give the same test, therefore it is not specific. The agglutination and conglutination tests are very sensitive, but are non-specific, as they also give positive results with bean meal.* Using the serological tests as a means of detecting ricin has met with similar results, in our hands, with the possible exception of the precipitation test which we found to be somewhat non-specific with bean meal, also that normal serum may be precipitated with a saline extract of castor pomice.

CONCLUSION

It would seem that castor pomice is highly toxic for animals and should be fed only when it has been definitely determined that the toxalbumin has been destroyed. Boiling or dry heat and exposure to the air will destroy the toxin. Boiling has been found to give the more certain results. Castor pomice may be tested for the presence of the toxalbumin by injecting a rabbit with 0.5 cc of a saline extract of the suspected feed. The use of the complement fixation test or other serological test, if properly controlled, will aid in determining the presence or absence of the toxalbumin.

*Pfeiler and Engelhardt. Landu. Jahrb., 53. 1919.

STANDARD VETERINARY LITERATURE

By W. L. WILLIAMS, *Ithaca, N. Y.*

Standard Veterinary Literature may be defined as the systematic arrangement and consideration of recorded veterinary knowledge. It is not a fixed entity, but is undergoing constant development as new facts are brought to light. Such modifications are constructive and do not disturb the foundation.

The systematic study of standard veterinary literature constitutes the vital basis for progress in veterinary science. The veterinary profession is now passing through an important crisis, as is evidenced by an alarming decrease in the numbers of veterinary students, by the many desertions from the profession and by other signs. Various reasons have been advanced for this disturbing state. Among these, the part played by the disregard for standard veterinary literature has received little or no attention.

American veterinary schools have largely instructed students by means of lectures, without impressing upon them the vital importance of seriously and constantly studying and consulting standard treatises. Anatomy has perhaps suffered least, because it has been regarded from the first as a laboratory subject, requiring a definite text as a guide. In other subjects standard literature has been quite largely ignored. The teacher, by depending wholly upon lectures, whether it be intentional or unintentional, leaves the impression with the student that in his subject there are no worth-while treatises. This has applied especially to the so-called *practical* subjects. They might better be designated the *terminal* subjects, for after all the ultimate aim of anatomy, physiology, bacteriology, pathology and the rest are designed to enable the student to secure such an understanding of the science that he may be able to prevent, cure or alleviate disease. A large part of the study of veterinary science is foundation-building for an understanding of medicine, surgery and obstetrics. Perhaps the extreme example of disregard for standard veterinary literature is in the domain of obstetrics, with the inseparable problem of diseases of the genital organs.

In the past the most populous veterinary colleges have been in great cities. In these the instruction, or alleged instruction, has been largely limited to lectures by men who had had no

experience in most of the fields they were supposed to illuminate. They knew something of the diseases and accidents of city work-horses, and of dogs and cats, but while these continue as subjects of importance, others now quite overshadow them. One of the most acute problems in veterinary science today is the control of diseases of the genital organs which interfere with reproduction. The majority of veterinarians in practice learned their obstetrics and genital diseases from lectures by men whose experience in this field was limited to geldings. It is certainly very largely due to this fact that genital diseases of animals is today the basis of the most colossal and disgraceful demagogery and fraud in the history of veterinary science.

American veterinary education inherited from Great Britain the misconception that the *theory* of veterinary science should be taught in the school (by a theorist?) and the *practical* part, during college vacation, by a practitioner. If the college had 100 students they had their *theoretical* instruction by a small group of men unable to teach the terminal subjects properly and they were then turned over to 100 nondescript, irresponsible practitioners who were not generally teachers in any true sense, and from these they were expected to get efficient teaching. Consequently nobody was responsible, and no vigorous regard was kindled for standard veterinary literature. Americans commonly boast of their ability to outdo the British and some of the colleges promptly scored a triumph (?) by having their students practice on their own account during college vacations. Fortunately these practices have been abandoned.

In this way veterinary science became to many a jumble of fact and fiction without any enduring basis, or any correlation between any two subjects in the curriculum, and the miseducated veterinarians, without secure foundation, were exposed to numerous perils. One of the most acute of these dangers at present is their want of power to resist gross commercialism. One group of veterinarians, imbued with an intense commercial spirit, has veered from the honored lines of veterinary activity and entered upon a career having as its only goal financial gain. They concoct an alleged cure or preventive for each known disease and extras for unknown maladies. Keen observers of conditions, they have entered this field because they knew there was a demand for nostrums among insecurely educated men.

The nostrum factories are largely the effect, rather than the cause of this breakdown in the profession. The point has now

been reached where the nostrum vendor offers for sale an alleged remedy for each animal disease which the laws do not prohibit doctoring, the dose of the nostrum is prescribed, a hypodermic syringe is offered, the nostrum factory relieves the practitioner from the heavy labor of thinking, especially about the nature of the disease, and will make a diagnosis if the practitioner will send a sample of blood, feces, urine, saliva or discarded cud and, with a dose of medicine will include as a prize package, a fine prognosis.

The practitioner is wanting in the secure foundation obtainable only from conscientious study of standard literature, has no standard library which he may consult, and drifts along without chart or compass. The nostrum vendor industriously plies the muddled practitioner with alleged literature, often flavored with some which is real, in a manner to intensify the deceit and the practitioner constantly and hopelessly sinks deeper and deeper into serfdom. In his dismay he grasps at current veterinary literature as a reliable support. Here he finds the advertising columns of most journals gorged with nostrum propaganda and the reading columns themselves are permeated by cleverly disguised contributions which are fundamentally designed as nostrum advertisements.

Such is the article on page 736 of the JOURNAL OF THE A. V. M. A. for March, 1923, with foot notes indicating that four other articles of the same tenor, emanating from the same nostrum factory, have invaded the reading columns of two additional American journals, leaving but one with its columns unpolluted from this source. The subscribers pay the cost of publication of these directly, and indirectly pay for propaganda from the same factory appearing in the advertising columns. If each reader had at hand and studied carefully one of the standard treatises upon endocrinology, the nostrum factory would not waste its ink in writing such stuff.

On page 78 of the JOURNAL OF THE A. V. M. A. for April, 1923, Professor Sisson justly and vigorously criticises the sayings of two alleged sterility experts, one of whom is a noted nostrum manufacturer and the other of similar ideals but cloaked in the professorial gown of a great university. The former states braggingly, "it is not possible * * * to make specialists of you here in a couple of hours (!) * * * the next thing you ought to do is to come and spend a week with me (at my nostrum factory), and I will make real men of you."

According to Genesis I, the Creator made Adam in one day

but there is nothing on record to indicate that he ever tried to make another in so brief a time. The serious imperfections of Adam were possibly due to his having been thrown together too hurriedly, and the boast of a nostrum manufacturer that he can make a real man in seven days should not be accepted without investigation. If his hearers or readers had been familiar with the existing literature upon sterility, he would not have made an assertion so foreign to the facts. One of the chief aims of nostrum makers and vendors is to leave the impression upon their audience that no valuable standard literature exists, upon the subject being discussed, and that their boastful words constitute all that is known upon the subject and that this is their personal creation.

Veterinary journals and literary programs at veterinary conventions are vital to the growth and development of veterinary science. They can never replace standard veterinary literature. Current veterinary literature should be jealously guarded and as rapidly as possible should be purged of the pollution which is now so insidiously and constantly permeating its advertising and literary pages. One of the greatest aids to clean and helpful current veterinary literature is in the development of a higher regard for, and more intimate acquaintance with standard writings.

HARD ON THE PEOPLE

"Dynamiting people out of cars on to horses." This will be the slogan of the first annual horse show, to be held at the Michigan Agricultural College, at East Lansing, May 30. The Memorial Day fete, the first to be held, is to be sponsored by the Reserve Officers' Training Corps of the M. A. C. Cups and ribbons are to be awarded for the various events. The horse show will be the social event of the season.

DR. J. S. ANDERSON JOINS CORN STATES

Dr. J. S. Anderson (Chi. '94) of Aurora, Nebr., has joined the veterinary service and sales force of the Corn States Serum Company and will have his headquarters at 2118 Lake Street, Lincoln, Nebr. Dr. Anderson practiced for a long time in Seward, Nebr., was a member of the Nebraska State Board of Veterinary Medical Examiners for fourteen years, and served as State Veterinarian of Nebraska from 1915 to 1919. Dr. Anderson is one of the most favorably known veterinarians in the Central West and we wish him success in his new connection.

A CONFIDENTIAL TALK WITH DR. SEPTIMUS SISSON

By J. F. DEVINE, Goshen, N. Y.

After reading in the April number of this JOURNAL the impetuous criticisms by Dr. Sisson, my first thought was to laugh at those pertaining to myself. Knowing the doctor slightly, I thought that perhaps, in a fit of nocturnal wanderings, he had become twisted in his serpentine name, had hallucinations, and, under this spell, belched forth what he knew not.

In extending my charitable view I said: "Those who read it will recognize at once that the writer was afflicted more with bile than brains." But, on further reflection, it occurred to me that it might be well for someone to stop occasionally, long enough to tie a few bowknots in the ears of some of the jackasses that from time to time inflict our professional journals with their venom.

Dr. Sisson criticizes the statement, yea, ridicules it, spits on it, that a man can become so proficient in sterility work as to be able, in most cases, to tell within three or four days (which gives a leeway of eight days) how long a cow has been bred, during the period from 6 to 12 weeks of pregnancy, which is of distinct advantage in the case of accidental service, or where more than one sire is used in a herd. He then adorns himself with a celestial halo and warns us that there are no "Norm-Tables of bovine embryos, and that no veterinary anatomist, in this country at least, has ever had the necessary time, facilities or material for such an extensive research." May we ask what does a capable clinician care for what the anatomy sharks have failed to discover? When they know so little, why is it that one presumes to criticise and abuse others?

I have a suggestion. Let Dr. Sisson secure for our next clinic, at the A.V.M.A. meeting, ten dairy cows that have been bred and have conceived, ranging in pregnancy from 6 weeks to 3 months, having accurate records of the dates of breeding, and I will promise to examine them at the clinic and tell him, in over 75% of the cases, within 4 days of the date the animal conceived. This is an opportunity to prove the sincerity of my statement or to add more glory to the king of critics, in the presence of an audience. Anyone who has even a meager knowledge of sterility work knows that we do not measure an embryo by palpation.

We have no concern, as a matter of fact, in its size *per se*. It is the size, shape, tension and density of the pregnant horn that guides us.

Second criticism. Here the doctor surely has it on us. While we did refer at the clinic to the advantage of knowing the normal size and pulse of the arteries supplying the uterus, we made particular reference to the posterior uterine *or* vaginal artery. The stenographer did not catch us just right, and ran the words together, reporting it as "posterovaginal" artery. This was an extemporaneous talk. It was not submitted to the author for correction, and was not intended as a manuscript for a text-book; but we would warn all stenographers in the future, if they err in reporting a meeting, let the condition for accurate hearing be ever so unsatisfactory, that they may expect to have Dr. Sisson swoop down upon them and out-vixen Xanthippe in his invocation of the God of Vengeance. Possibly here, too, the doctor was whipping someone else over our shoulder and his spleen was meant for W. L. Williams; because by referring to an article I wrote on the "Diagnosis of Pregnancy" in VETERINARY MEDICINE, it will be found that I referred to the artery as the posterior uterine artery, by some called the vaginal artery. And then if we refer to Williams' "Diseases of the Genital Organs of Domestic Animals," p. 123, first paragraph, we find that Williams states: "The posterior uterine or vaginal artery is given off from the internal pudic."

We note further that the doctor insinuates that we do not know even where the ovaries are located, because when we were working on the Jersey cow at the clinic, I stated that my experience has been that most beginners reached too far in, to locate the ovaries. After attempting for the past ten years to assist others in locating the organs, for manipulation, during which time I have given at least 100 or more demonstrations, I found that the inexperienced operator invariably reaches too far in, before searching for the uterus and ovaries. So, at the clinic, I drew the attention of the audience to the fact that after I had grasped the cervix and ovaries, that my arms were in but a short way past the wrists. It is at once apparent from the doctor's deductions that we knew nothing about what we were doing.—Did not know our wrists from our elbows. As to the truth of this, or the justice of such criticism, we will leave that to our colleagues with whom we have worked.

The doctor does not stop here. No, indeed! It is hard for

such a mighty mind to be controlled by terminal facilities. He advises us in the third paragraph of this storm of hostilities, that he is not a pathologist or clinician, but he is quite certain he is capable of criticizing a man that has been an honest, hard-working clinician for twenty-five years; and when he has spent his wrath on him, he then goes after the pathologist. I do not know how the pathologist will take his criticism, but I will say that if every speaker has to be exposed to malignant vituperation and insolent cynicism for such petty and unimportant violations, how long will it be before it is unsafe for anyone to attempt to take part, extemporaneously, at our clinics or our meetings? There is not a constructive or important word in the doctor's article, notwithstanding that he regrets such criticisms are not pleasant to make. If he alone has not received pleasure by putting his spawn into print, then his splash has been in vain. It is Gall, masquerading as Grace.

TWO NEW STATE VETERINARIANS

Dr. F. A. Zimmer of Pataskala, Ohio, has been appointed State Veterinarian of Ohio, succeeding Dr. B. H. Edgington. Dr. Zimmer is a graduate of Ohio State University, class of 1909. Immediately after graduation he entered upon field work, under Dr. Paul Fischer, who was State Veterinarian at the time. Dr. Zimmer was later appointed chief of the field veterinarian staff, which position, together with that of Acting State Veterinarian under Dr. Fischer, he held until 1915. From that date he was in active practice at Pataskala, until March 1, 1923, when he assumed his new duties.

Dr. Clifton D. Lowe has been appointed State Veterinarian of Tennessee succeeding Dr. M. Jacob, who has been Acting State Veterinarian. Dr. Jacob's duties at the University were so heavy that he was unable to look after two offices, although great pressure was brought to bear upon him to accept the post of State Veterinarian. Dr. Lowe is a graduate of Ohio State University, class of 1910. Following graduation he entered the employ of the Federal Bureau of Animal Industry, then took up work in the Extension Division of the University of Tennessee, later was Veterinarian for the Southern Railway and recently has been connected with the American Aberdeen-Angus Breeders' Association, as Southern Field Representative.

CLINICAL AND CASE REPORTS

(Practitioners and others are invited to contribute to this department reports of unusual and interesting cases which may be helpful to others in the profession.)

END RESULTS IN THE USE OF POTASSIUM DICHROMATE

By H. W. WILSON, Helena, Ark.

It was with considerable interest that I read the article entitled "Observations on the Treatment of Purpura Hemorrhagica," in the March number of the JOURNAL, and wish to state that during my period of duty at A. R. D. No. 317, Camp Pike, Ark., from September 2, 1917 to March 5, 1919, I purchased the first potassium dichromate used there, as it was not on the table of drugs listed for distribution by the Medical Supply Depot.

I wish to add to what has been written, that I gave as high as 45-gr. doses, repeated in 12 hours in a few cases, and repeated many others as often as every 24 hours, without any ill effects in some cases, and very gratifying results in many others. Dr. L. E. Smith, of Iowa, who was there during this work, may have given as large a dose as 45 grains, repeated more often than 48 hours, also.

Now for some observations that the other boys may not have had the opportunity to come in contact with. Instead of returning to Illinois to practice I located in Arkansas, upon my discharge from the Army, and in this way had an opportunity to see hundreds of mules and horses that had been purchased at the auction sales held at Camp Pike. I recognized many of these as having been in the hospital and some for pupura hemorrhagica. Several were deaf and blind, while others were either deaf or blind. There may be no connection between these after-effects and the treatment, but my opinion is that while we did not have visible signs of the bad after-effects of giving potassium dichromate intravenously *then*, months later these results were noticeable in the form of the above mentioned unsoundnesses.

In the first few cases, where even a drop or two of the solution was allowed to escape into the muscular or subcutaneous tissues, or where later on, when the technique was more careful, but where by accident, some of the solution was deposited in the

tissues or where the needle was not cleared of all of the solution, by the injection of water or allowing some blood to run out through the needle, intense suppuration took place. In one case, posted by me, in which this unfortunate occurrence took place while I was administering the solution, the jugular vein was nearly obliterated in the mass of degenerated tissue.

While I have used potassium dichromate in these cases since returning to practice, I have used the drug in greater dilution. Instead of 16 ounces of water I use 24 to 32 ounces of distilled water to the 30- or 45-gr. dose. Any drug capable of producing the effects noticed, by its deposit in the subcutaneous or muscular tissues, is certainly causing some action when injected into the blood-stream, and, although these cases respond nicely, I believe the story is not finished until the last installment is written, which may read: "Treatment successful, but patient deaf or blind." I should like to have the opinion of Dr. L. E. Smith as well; maybe he has had an opportunity to gather additional information in this regard.

MOIST ECZEMA OR CANKER OF THE EAR OF THE DOG¹

By J. P. TURNER, Washington, D. C.

The following treatment for moist eczema (canker) of the ear of dogs will be found very satisfactory:

1. When the ears are very painful, drop a small quantity of 4 per cent solution of novocaine in each ear and carefully work it into the ear. Wait five minutes before proceeding further.
2. Swab out each ear thoroughly with hydrogen peroxide (pure) and clean away all discharge and scales, until the ears appear clean. This may require a half-hour of work or more. Dry out with cotton on dressing forceps.
3. With small quantity of cotton on dressing forceps, cauterize the ears as deeply as possible with silver nitrate solution 15 gr. to 1 oz. Dry out thoroughly with cotton.
4. Pour small quantity of alcohol into each ear, in order to dehydrate the skin. Swab out the cotton until dry.
5. Pack ears as deeply as possible with bismuth-formic-iodide powder.

This treatment to be administered twice a week. The ears are to be packed daily with the bismuth-formic-iodide powder.

¹From the University of Pennsylvania Veterinary Extension Quarterly, No. 9.

REVIEWS

THE TOPOGRAPHICAL ANATOMY OF THE THORAX AND ABDOMEN OF THE HORSE. O. Charnock Bradley. Pages XII, 204, 85 figures. Published by William Wood & Co., New York.

As stated by the author in the preface, the aim of this book is the same as that of its predecessor, "The Topographical Anatomy of the Limbs of the Horse," namely, to serve as a sufficiently full dissection-guide for the student, and possibly to help the practitioner when in doubt respecting the topography of a region.

As a dissection guide the book seems admirable as far as it goes. But the reviewer, in the light of more than thirty years of experience, does not believe that the instructions for dissection are sufficient for the average veterinary student (in this country at least), unless he has had considerable training and experience in similar laboratory work, or is quite closely supervised in using the present guide. As an example of what is here meant, there do not appear to be any instructions as to the dissection of the inguinal canal. Of course the situation is quite different in case the student has already had, say, a year of discipline in laboratory technique of the kind needed.

The reviewer is a firm believer in the prime importance of requiring students to acquire proficiency in dissection, not only because this is absolutely necessary for the acquisition of sound anatomical knowledge, but also on account of its great value as training for precision in the clinical branches, especially physical diagnosis and surgery. Of course the foregoing is not to be understood as favoring anything of the nature of a Prussian drill-master, either in person or in the form of a book. Initiative and resourcefulness on the part of the student are to be encouraged, but, on the other hand, it is important that the time and energy of the instructor be conserved to the end that he may devote himself largely to the elucidation of difficult points and to adding to present knowledge.

The reviewer must confess regretfully that he is disappointed over the relatively small amount of strictly topographic matter included; this refers both to text and figures. Perhaps expectation was unreasonably high, and "the wish was father to the thought." An up-to-date and well-illustrated topographic work is very badly needed, and is not yet available either in the

present work or in Montané & Bourdelle's monumental volume. Diagrams have their uses, but only in an extremely limited degree in topography. We need, especially, good reproductions of sections, such as are provided in works on Human Anatomy. Extensive use of sections as such and by means of the projection lantern convinced the reviewer long ago that this is the only means by which one can acquire accurate and adequate knowledge of many topographic data which are essential in the application of Anatomy in Clinical Diagnosis and Treatment.

The veterinarian is even more dependent on such knowledge than is his confrere in human medicine, since the X-rays and the fluoroscope are not yet available for dealing with the larger animals. The Author has rather disarmed criticism by labeling figures 39 to 42 as diagrams. But even so could not the ventral part of the diaphragm have been correctly indicated? The error here is serious, because it has necessarily involved correlative errors concerning the topography of the heart and the anterior flexures of the colon. The delineation of the ventral border of the right lung in figures 6 and 39 is decidedly not in conformity with observations of careful dissections and sections or auscultation and percussion—so far as the latter are practicable. The pelvic flexure of the colon is shown in a quite exceptional position; it is usually in the right inguinal region. The statement (p. 96) giving the impression that the terminal part of the great colon is in "the neighborhood of the pelvic inlet" is decidedly misleading and is not in conformity with the correct statement (p. 100) that it is ventral to the left kidney. This is one of a good many points which are of practical importance with reference to exploration *per rectum*.

The statement (p. 115) that the *saccus caecus* of the stomach is "suspended" from the left lumbar part of the diaphragm by the continuity of the gastro-splenic and phrenico-splenic ligaments does not seem justifiable. The use of the word "suspended" to designate peritoneal attachments of viscera to the bodywall in general connotes an erroneous conception and it would therefore be a good thing if we could get rid of it.

The inguinal ligament (of Poupart) is referred to in the following way (p. 84): "A considerable band of tendinous fibres stretches from the tuber coxae to the pecten of the pubis." This is an example of the danger incurred by transferring both the name and the idea of a structure from human anatomy. The band-like thickening of the lower border of the aponeurosis

of the external oblique muscle, which stretches between the anterior-superior iliac spine and the pubic tubercle, is a special development which is correlated with the downward thrust of the weight of the abdominal viscera of man. In the horse the weight of the viscera centers towards the umbilical region, and in conformity therewith there is nothing like the ligament which is present in man. The so-called ligament of the horse, ox, etc., is no other than the posterior part of the aponeurosis of the external oblique muscle; the term "ligament," as applied to it in veterinary anatomy, is an unfortunate misnomer and students need to be warned not to be misled by it.

About twenty of the illustrations are most satisfactory from the topographic standpoint; some of them are quite superior to those found in other works and are therefore most welcome additions to our literature. The Author's reference in the preface to "the existing difficult circumstances" strikes a sympathetic chord among workers in the same field in this country. Indeed we seem to be even worse off here in this respect, as publishers of standing refuse even to consent to much-needed revision of existing works, much less to undertake the publication of new literature.

Dr. Bradley's book can be warmly recommended to students to be used in connection with other books which contain fuller descriptions of a good many structures. The practitioner will also find it useful with reference to certain topographic points.

S. S.

VETERINARY HYGIENE. Care of Health and General Science of Contagious Diseases of Domesticated Animals. Martin Klimmer, Ph. D., D. M. V., Professor of Veterinary Hygiene in the Veterinary High School of Dresden. Third, newly revised edition. Authorized translation by A. A. Leibold, D. V. M., formerly Professor of Physiology and Hygiene, Chicago Veterinary College. Annotations by John R. Mohler, A. B., V. M. D., Chief of the U. S. Bureau of Animal Industry. 430 pp., with 278 illustrations. Published by Alexander Eger, Chicago, 1923. Price \$4.75, cloth.

This is a translation of a standard German treatise, and the reader will be agreeably surprised upon noting the variety of subjects which the Author has dealt with under the single term "Veterinary Hygiene." The book is written with characteristic

German thoroughness and strict attention to detail. The Translator has attempted to render the English as literal as possible, at the same time avoiding stilted phraseology, which is so often necessary when adhering closely to the original text. The Translator has seen fit to add occasional notes regarding conditions and occurrences in countries other than those covered by the Author. There need be no hesitation, upon the part of American veterinarians, to purchase this book upon the score that it has been written from the standpoint of a German.

The book is divided into eight sections. These deal respectively with the following subjects: The Atmosphere, The Soil, Water, Noxious Agents in Feeds, The Care and Management of Animals, The Pasture and Exercising Lot, The Stable, and Contagious Diseases. In the latter section the subjects of biological therapy and tests are very concisely presented. This section also contains some very valuable data in connection with disinfection.

With the trend of veterinary science so strongly in the direction of disease prevention, it will stand every veterinarian in good stead to read this book and digest its contents. The veterinarian is the logical person to dispense the kind of information that is contained in this work, and unless veterinarians embrace every opportunity for rendering this sort of service, our farmers and live stock breeders will not get into the habit of going to the veterinarian to get advice of this kind. In translating this work and placing it at the disposal of the English-speaking veterinarians the Translator has rendered them a real service. The publisher has shown his confidence in our profession as a consumer of good veterinary literature by placing this work at our disposal.

ABSTRACTS

FÅGELTUBERKULOSENS BEKÄMPANDE MED LEDNING AV TUBERKULINUNDERSÖKNING. (Eradication of Avian Tuberculosis by the Aid of the Tuberculin Test). E. Klarin. Skandinavisk Veterinär-Tidskrift, Uppsala and Stockholm, 1922, 12, 170-175. (Reprinted from Abst. of Bact.)

This article is a review of the results obtained by three Swedish veterinarians who used the method of Van Es in applying the intradermal tuberculin test for the purpose of combatting avian tuberculosis. A plan for the eradication is given. Avian tuberculin was found the most reliable. By testing, the following

classes of birds were removed from the flock: (1) Typical reactors, (2) Those giving doubtful reaction, and (3) Those failing to react but which were found suspicious on physical examination. The latter class was usually found to be suffering with old cases of tuberculosis. They were generally cachectic. One of these veterinarians thinks that the test should be repeated within four weeks after the first one in order to detect new cases which might have slipped by in the first test.

The author is of the opinion that these tests (employed in many flocks, numbering several hundred birds) show that the tuberculin test as worked out by Van Es is of great value in the eradication of avian tuberculosis. It is also brought out that thorough physical examination of non-reactors must accompany the test.

H. J. S.

KÄKMYOSIT hos HÄST (Myositis of the Jaw in the Horse). Hugo Heijbel. *Svensk Veterinärtidskrift*, Stockholm, 1922, 27, 1-12. (Reprinted from *Abst. of Bact.*)

In this article a disease of colts is described which is characterized by trismus with subsequent degenerations of the muscles involved, total or partial paralysis of the pharyngeal muscles and at times paralysis and degeneration of certain groups of muscles in the fore limbs, especially the extensors of the carpal joint. Loose bowel discharges, or even diarrhea, generally precedes these symptoms. The disease runs a rapid course (two to ten days) and is usually fatal. Post-mortem examinations revealed none but local inflammatory degenerative changes in the muscles of the jaw and fore limbs. Specimens sent to the veterinary institute for bacteriological examination revealed streptococci, which Professor Bergman was inclined to believe were the cause of the disease. The author, however, points out that the disease usually shows no fever until the later stages, is not contagious and in general gives the impression of being due to some digestive disturbance rather than streptococcic infection, the latter being, in his opinion, purely secondary or terminal. The disease appears to be a new ailment and has caused great losses in certain districts in Sweden.

N. Sture Karlberg suggests the possibility that this disease is identical with azoturia, due to the fact that in the cases coming

under his observation hemoglobinuria was always present and the disease occurred under conditions which would predispose to azoturia.

H. J. S.

PSEUDOTUBERKULOS FRÅN PATALOGISK-ANATOMISK SYNPUNKT. (Pseudo-tuberculosis from the Viewpoint of Pathological Anatomy). Sven Wall. Svensk Veterinärtidskrift, Stockholm, 1922, 27, 107-114 and 135-140. (Reprinted from Abst. of Bact.)

The author discusses the etiology and pathology of diseases in man and animals which on autopsy reveal tubercular lesions. Such lesions have been found in all domesticated animals, chickens, wild and domesticated rabbits, guinea pigs and man. Disease processes of this kind may be caused mechanically by foreign objects such as small particles of coal or similar objects. Pseudotuberculosis developing from areas of necrosis is also included under mechanical or foreign-body pseudotuberculosis. As an example of the latter fat necrosis in cattle is mentioned. The various microorganisms mentioned as causes of pseudo-tuberculosis include yeasts, molds and bacteria. Worms are mentioned as a cause of pseudotuberculosis in sheep and horses. Under bacterial pseudotuberculosis a number of diseases are described.

The author calls attention to the fact that pseudotuberculosis is not a term designating one particular disease. It is a term applied to conditions which on macroscopic examination resemble tuberculosis.

H. J. S.

TRE FALL AV PENISTUBERKULOS HOS NÖTKREATUR (Three cases of Tuberculosis of the Penis in Cattle). Arvid M. Berhman and Bertil Blomberg. Skandinavisk Veterinär-Tidskrift, Uppsala and Stockholm, 1922, 12, 1-21 (Reprinted from Abst. of Bact.)

A review of the literature on similar diseases in man and animals and personal observations on three cases in cattle, together with three macroscopic and five microscopic illustrations. The authors conclude that, as one of these cases was proved to be primary and the other two were most likely so, tuberculosis of the penis is a result of infection during coitus. This seems only natural when it is considered that tuberculosis

of the uterus in cows is very common. If accurately diagnosed tuberculosis of the penis might prove to be of more common occurrence in bulls than is now assumed. Two guinea pigs inoculated with smegma from the prepuce of the third case investigated died from tuberculosis, indicating that such cases may be open.

H. J. S.

STUDIER I SERUMKONTROLL OCH BAKTERIOLOGISK KÖTTKONTROLL.

(Studies on the Control of Serum and Bacteriological Inspection of Meat). O. Brandt. Skandinavisk Veterinär-Tidskrift, 1922, Uppsala and Stockholm, 12, 127-153. (Reprinted from Abst. of Bact.)

This is a study of the methods employed at the State Institute for Experimental Therapy, Frankfurt A. M., in determining the potency of serums and antitoxins.

The second part of this article deals with the methods employed in the bacteriological examination of meat in the slaughter houses in Berlin, München and Hamberg. The significance of the presence of various bacteria is also discussed. The various charts employed in this work are reproduced.

H. J. S.

WHERE TEDDY BEARS COME FROM

Botany Prof.: "What animals come from plants and what plants produce them?"

Frosh: "Teddy-bears come from underwear plants."—*'Ec'-Aw*

PLAIN ENOUGH

First Cockroach: "Hey there! What's your hurry? Where's the fire?"

Second Cockroach: "Fool! Can't you read? Don't you see it says 'Tear along this line'?"—*Goblin*.

STILL HAS IT

Irate Farmer: "Look here, you swindler! When you sold me this horse you said that in three months' time I wouldn't part with it for three times the price I gave for it!"

Dealer: "Well, you haven't, have you?"—*Breeders' Gazette*.

AMERICAN VETERINARY MEDICAL ASSOCIATION
Proceedings of Fifty-ninth Annual Meeting, St. Louis, Mo.
August 28 to September 1, 1922

(Continued from the April JOURNAL)

SECTION ON EDUCATION AND RESEARCH

TUESDAY MORNING, AUGUST 29, 1922

The first session of the Section on Education and Research was called to order at ten o'clock, by Dr. E. M. Pickens, of College Park, Maryland. (No stenographer being present, the minutes were recorded by the Secretary.)

The following papers were delivered:

"Preliminary Report on the Differentiation of the Various Organisms Belonging to the Hemorrhagic Septicemia Group," by Drs. C. P. Fitch and E. N. Nelson, St. Paul, Minnesota. (Published in the JOURNAL, this issue, page 147.)

"The Character and Possible Significance of the Bang Abortion Bacillus that Attacks Swine," by Dr. W. E. Cotton, Washington, D. C. (Published in the JOURNAL, November, 1922.)

"Investigations on the Immunology of Swine Plague," by Drs. R. R. Birch and J. W. Benner, Ithaca, New York. (Published in the JOURNAL, November, 1922.)

"The Veterinary Curriculum: Some Suggested Changes," by Dr. V. A. Moore, Ithaca, New York. (Published in the JOURNAL December, 1922.)

ADJOURNMENT

FRIDAY MORNING, SEPTEMBER 1, 1922

The second session was called to order at eight-forty-five o'clock, by Chairman Pickens.

CHAIRMAN PICKENS: We have one paper left over from the previous session, "The Role of the Udder and its Secretion in Bovine Infectious Abortion," by Dr. Ward Giltner, I. F. Huddleson and R. L. Tweed. None of the gentlemen is present. What shall we do with the paper?

DR. C. P. FITCH: I move you, Mr. Chairman, that the paper be read by title and that it be printed in the proceedings.

The motion was seconded and carried.

SECRETARY GOSS: "The Role of the Udder and its Secretion in Bovine Infectious Abortion," by Dr. Ward Giltner, I. F.

Huddleson, and R. L. Tweed. (Published in the JOURNAL, November, 1922.)

CHAIRMAN PICKENS: That brings us up to the last session. The first paper in this session is entitled, "Some Attempts to Control Strongyles in Aneurisms by Means of Intravenous Injections of Drugs, by Drs. Maurice C. Hall and J. E. Shillinger, of Washington, D. C.

DR. FITCH: I move we take the same course with reference to that paper as was taken on the first paper.

The motion was seconded and carried.

SECRETARY GOSS: "Some Attempts to Control Strongyles in Aneurisms by Means of Intravenous Injections of Drugs." (Published in the JOURNAL, December, 1922).

CHAIRMAN PICKENS: Dr. Goss informs me we have another paper submitted by the same authors. This paper, I understand, is not on the program.

DR. GOSS: This paper is entitled, "The Removal of Heterakids from the Ceca of Chickens by Rectal Injections of Anthelmintics," by Drs. Maurice C. Hall and Jacob E. Shillinger.

DR. FITCH: I move the paper be referred back to the authors.

The motion was seconded and carried. (Paper published in the JOURNAL, February, 1923.)

CHAIRMAN PICKENS: The second paper on the program is entitled, "'Jiggers,' or Bot Anaphylaxis," by Dr. A. E. Cameron, Lethbridge, Alta., Canada. (Paper read and published in the JOURNAL, December, 1922.)

We will proceed with the next paper on the program, entitled, "Studies in Complement Fixation in Bovine Tuberculosis," by Drs. J. A. Kolmer, Dermatological Laboratories, and Fred Boerner, Jr., Philadelphia, Pa.

DR. BOERNER: Mr. Chairman and Gentlemen of the Section of Education and Research: It has been necessary for us to divide our paper into three parts. We really have three papers. When we sent our title to the Secretary we thought of preparing one paper, but it was necessary to divide it into three parts, to cover the different parts in more detail than we contemplated. I have, however, abstracted the three papers, the object being not to take too much time on the program.

(Dr. Boerner read his paper entitled "Studies in Complement Fixation in Bovine Tuberculosis," which is divided in three sections, with the following titles: 1. "The influence of heating sera and the kind and duration of primary incubation upon the

occurrence of specific and non-specific tuberculosis complement fixation tests with cattle sera." 2. "The occurrence of specific tuberculosis complement fixing substances in the sera of tuberculin-negative cattle." 3. "The diagnostic value of the complement fixation test in bovine tuberculosis." (To be published in the JOURNAL.)

CHAIRMAN PICKENS: At the last meeting of the Section we didn't have a stenographer until the last paper was read, so we have no record of the discussion on earlier papers. If the people who entered into that discussion will hand in their remarks to Dr. Goss, we can then have our proceedings complete; otherwise we will have no record.

The next paper on the program, and the last one, is entitled, "Pathogenicity of *Bacterium Suisepcticus* for Hogs," by Drs. A. F. Schalk and L. M. Roderick, of the Agricultural College, North Dakota. Are either of the gentlemen here? (No response).

What is your pleasure with this paper?

DR. FITCH: Does the Secretary have the paper?

SECRETARY GOSS: I have it.

DR. FITCH: I move we take the same course as we took with the other papers.

The motion was seconded and carried.

CHAIRMAN PICKENS: We are supposed to adjourn at ten o'clock, and if there is no opposition we will not take time to go into it. The Secretary will read the paper by title.

SECRETARY GOSS: "Pathogenicity of *Bacterium Suisepcticus* for Hogs."

CHAIRMAN PICKENS: The paper will be published in the proceedings. (Published in the JOURNAL, December, 1922.)

Does anybody have anything to bring before the Section before we proceed to the election of officers? If not, nominations for Chairman of this Section are in order.

DR. DIMOCK: Mr. Chairman, I take pleasure in nominating Dr. Pickens for Chairman of this Section for next year.

CHAIRMAN PICKENS: I decline the favor for some one else.

DR. FITCH: I would like to place in nomination a man who has served the Section faithfully for a number of years, and has been the means of establishing this as one of the Sections of this Association. I take great pleasure in placing in nomination Dr. Goss for Chairman of this Section.

The nomination was seconded.

CHAIRMAN PICKENS: Are there any other nominations?

DR. BOERNER: I move you the nominations be closed.

The motion was seconded and carried.

DR. FITCH: I move the unanimous election of Dr. Goss as Chairman of the Section.

The motion was seconded and carried.

CHAIRMAN PICKENS: I think Dr. Goss can cast a ballot for himself.

The next officer to be elected is Secretary of the Section. We are ready for nominations.

DR. BOERNER: I nominate Dr. Pickens for Secretary of the Section.

The nomination was seconded.

The newly elected Chairman, Dr. Goss, took the chair.

DR. R. R. BIRCH (Ithaca, N. Y.): I move the nominations be closed.

The motion was seconded and carried.

DR. BIRCH: I move the unanimous election of Dr. Pickens as Secretary.

The motion was seconded and carried.

CHAIRMAN GOSS: This, I think, completes our business for this morning; unless there is other business to come before the Section, a motion to adjourn is in order.

DR. FRITCH: I move we adjourn.

The motion was seconded, and the meeting adjourned at ten-fifteen a. m.

ADJOURNMENT

GENERAL SESSION

FRIDAY MORNING, SEPTEMBER 1, 1922

The meeting convened at 10:25 a.m., President Kinsley presiding.

PRESIDENT KINSLEY: The first thing we will have this morning will be the report of the Audit Committee. Dr. Marsteller.

DR. MARSTELLER: "The Audit Committee has examined the Treasurer's report and finds it to be correct.

"A certified copy of the Treasurer's report, from a public accountant, will be placed in the hands of the Secretary. We recommend that the Treasurer's report be accepted.

"The Audit Committee recommends that the By-Laws be changed to provide for auditing the books of the Treasurer by a certified accountant and this report be submitted to the

Executive Board at each annual meeting, and that the Audit Committee be dispensed with.

"There is no use having an Audit Committee. The books of the Treasurer should be gone over by the auditor and that report go to the Executive Committee."

PRESIDENT KINSLEY: Gentlemen, you have heard the report. What is your pleasure?

DR. CAMPBELL: I move this report be adopted and the recommendation regarding the change of the By-laws come before our meeting next year.

PRESIDENT KINSLEY: Dr. Campbell moves that the report of the Audit Committee be received and that the recommendation serve as a notice for a change in the Constitution and By-laws, eliminating the Audit Committee. Is there a second to that motion?

. . . The motion was seconded by Dr. Treman . . .

PRESIDENT KINSLEY: Any remarks?

SECRETARY MAYO: In this report it is not provided who shall select the accountant. When I selected an accountant to audit my books this year, he said, "It is rather unusual that they should ask you to select an accountant to audit the books. It looks better for some one who is not interested in the matter to select the auditor." I am offering that as a suggestion.

PRESIDENT KINSLEY: I hope the Executive Committee will accept that suggestion. I believe it is a good one. Is there any further discussion?

. . . The motion was carried . . .

PRESIDENT KINSLEY: Next we will have the report of the Budget Committee.

SECRETARY MAYO: "The Budget Committee recommends that the following amounts, or so much thereof as may be necessary, be appropriated:

President's contingent fund.....	\$ 500
Intelligence and Education.....	1,000
Legislative Committee.....	1,000
Committee on Revision of Constitution and By-	
laws.....	300
Committee on Abortion.....	250
Treasurer.....	300
Publicity.....	1,000
Ten shares Horse Association of America.....	50

"And the necessary running expenses of the Secretary's office and Journal office."

PRESIDENT KINSLEY: Gentlemen, you have heard the report of the Budget Committee. What is your pleasure?

DR. STANGE: I move its adoption.

. . . . The motion was seconded and carried

PRESIDENT KINSLEY: Next we will have the report of the Resolutions Committee.

DR. CAMPBELL: "Report of Committee on Resolutions.

"WHEREAS, the recent act of Congress fixing the number of Army officers in active service at 12,000 has reduced the Veterinary Corps to a point where it is impossible to render adequate veterinary service; and

"WHEREAS, the American Veterinary Medical Association, mindful of its responsibilities in preserving and promoting health of animals in this country, of which the Army controls an important part, desires to go on record as favoring a change in the foregoing enactment, be it

"RESOLVED, that the Association, in convention assembled, declares itself as favoring a ratio of not less than $4\frac{1}{2}$ officers per 1,000 public animals, and instructs its Legislative Committee to use its best efforts to secure the necessary remedial legislation at the earliest practical opportunity; and be it further

"RESOLVED, that the Association extend a vote of confidence and moral support to the Surgeon General for his satisfactory administration of the Veterinary Corps and assure him of its abiding interest in the welfare of the Veterinary Corps and its willingness to render assistance, cooperation and material support in its behalf."

DR. V. A. MOORE: I move the adoption of the first resolution.

. . . . The motion was seconded

PRESIDENT KINSLEY: Any remarks?

DR. MERILLAT: I simply want to draw your attention to a paragraph of Major Foster's address last night. It seems to me it is a text for our future conduct towards the Veterinary Corps. This reads in effect about like this: For the first time in the military history of the United States, the word "veterinarian" or "the veterinarian" is included in the tables of organization.

I wonder if you comprehend the bigness of that remark. This Association has struggled for something like thirty-two years for status for the veterinarians in the Army, and only after the nation went into war, or when the world was at war and it was apparent that we would soon be involved in a fray, we succeeded, or at least it was decided to give veterinarians a certain amount of recognition, in so far as it gave definite rank to the existing personnel of the Veterinary Corps at that time.

We have been at war, and the general staff of the Army, in its hurried organization to effect some kind of effective fighting force, found it necessary to enlist the competent veterinarians

and give them some kind of satisfactory status. Since then it has been decided by Congress to organize the national defense on a very definite basis. It is now the law of our country to have a regular army which is the regular, martial, constabulary and training unit of the others, a National Guard as a second line of defense, and then the great population of the people as the organized reserve, and in this organization the veterinarians have been given just as good a standing as the engineers, just as good as the artillery, the infantry or the medical service, and has opened up these positions for you to accept.

I want to just say the word that it is a great reflection upon our loyalty to our profession that we have been indifferent to the offer of the Surgeon General in accepting these positions, and puts us in a position of having been insincere in our past efforts for recognition. All the American Veterinary Medical Association has done for veterinary service will go down in history as nothing more than a selfish movement to give rank to something like forty-five veterinarians, unless we show now that we were doing this for the good of the cause that we represent—the veterinary profession.

It seems to me that it is the duty of every able-bodied man, within the range of age designated in the law, to place his application before the Surgeon General and show him that we really meant something when we were asking for recognition during all of these years. (Applause.)

DR. CAMPBELL: I would like to amend Dr. Moore's motion to read that we adopt the resolution and instruct the Secretary to supply the Secretary of War, the Surgeon General and the Chairman of the House and Senate Military Committees with a copy.

DR. V. A. MOORE: I will accept that as the original motion.

SECRETARY MAYO: It is easy enough to get plenty of men in a great emergency. The General Staff has now provided a means by which they can be prepared in times of peace to meet these great emergencies, and it is your patriotic duty to join the Reserve Corps, so that it gives the Surgeon General and the General staff an opportunity of sifting the men, finding out their qualifications and their adaptability before emergency arises, and I hope that every one of you will look at it in that way, first, as a patriotic duty, as a citizen, and as a patriotic duty as a representative of our profession.

PRESIDENT KINSLEY: Any further remarks? If not, all in

favor of the motion which is the adoption of this resolution and the forwarding of copies thereof to the proper officials, signify by saying "Aye." Contrary "No." It is carried.

DR. CAMPBELL: Next resolution.

"WHEREAS, an effort is being made in Colorado and California to abolish animal experimentation, and

"WHEREAS, this Association, composed of over 4,000 veterinarians and representing every state and province of North America, fully realizes the saving of human life and of billions of dollars to the live stock industry in this country, which has resulted directly from knowledge gained through animal experimentation, be it

"RESOLVED, that the American Veterinary Medical Association make every reasonable effort to prevent any and all legislation that may interfere with or render impossible the production of biological products indispensable in the prevention or control of diphtheria, smallpox, whooping cough, typhoid fever, hog cholera, glanders, tuberculosis, and other diseases of man and animals; and be it further

"RESOLVED, that we shall deplore and use our best efforts to prevent enactment of any legislation that may hinder research under proper scientific control into diseases of man and animals that is now being carried on or that may be undertaken in the future for the benefit of mankind."

Mr. President, I move its adoption.

. . . . The motion was seconded and carried

DR. CAMPBELL: Next resolution.

"WHEREAS, the Blue Cross Society, under the direction of its President, Miss Maud Phillips, is endeavoring to promote legislation compelling the use of anesthetics in painful operations on animals; and

"WHEREAS, such legislation, if properly drafted and properly enforced, would contribute to greater humaneness in the handling and treatment of animals; be it

"RESOLVED, that the American Veterinary Medical Association which has always stood for kindness and consideration in the treatment of animals and the avoidance of all unnecessary pain in operations upon animals, endorse the motives of the Blue Cross Society in the aforementioned matter and commend its efforts to prevent undue suffering as a result of surgical or other painful operations."

I move the adoption of the resolution.

. . . . The motion was seconded and carried

DR. CAMPBELL: Next resolution.

"WHEREAS, this meeting has been a source of unusual inspiration and great educational value to the general practitioner and as such contributing in an unusual degree to the advancement of the greatest body of our membership; be it

"RESOLVED, that we commend the efforts of President Kinsley and those who have so ably assisted him in providing features of special interest to practitioners."

I move the adoption of this resolution.

. . . . The motion was seconded

PRESIDENT KINSLEY: It seems to me to be hardly worth while, because that is the duty of the officers of the Association.

SECRETARY MAYO: I will call for the question.

. . . . The motion was unanimously carried

DR. CAMPBELL: Next resolution.

"WHEREAS, the careful arrangements of the Local Committees and the Committees on Clinic have contributed greatly to the success of the meeting and the comfort and pleasure of those attending it; be it

"RESOLVED, that we extend to Dr. Rives and those assisting him the thanks of the Association for their earnest efforts for the success of the meeting."

I move the adoption of the resolution.

. . . . The motion was seconded and carried

DR. CAMPBELL: Next resolution.

"RESOLVED, by the American Veterinary Medical Association that we join with the American Medical Association in endorsing the Chemical Foundation in their efforts to provide the practitioners of America with American made medicinal preparations."

I move the adoption of the resolution.

. . . . The motion was seconded and carried

DR. CAMPBELL: Next resolution.

"WHEREAS, the Armour Packing Company, of East St. Louis, placed its killing-floor at the disposal of our Association for the examination of tuberculin reactors; be it

"RESOLVED, that we extend the thanks of the Association to Armour & Company for their kindness in this matter and also for refreshments furnished at the clinic."

I move the adoption of the resolution.

. . . . The motion was seconded and carried

DR. CAMPBELL: Next resolution.

"WHEREAS, the St. Louis Tourist and Convention Bureau has been diligent in looking after the details incident to our meeting and has been liberal in the entertainment provided, for which it has borne all expenses; be it

"RESOLVED, that we extend the thanks of the Association to the said Bureau for its cordial hospitality that has contributed so much to the success of the present meeting."

I move the adoption of the resolution.

. . . . The motion was seconded and carried

DR. CAMPBELL: The resolutions were signed by all the members of the Committee.

PRESIDENT KINSLEY: The next order of business will be the report of the Committee on Intelligence and Education.

. . . . (Dr. H. D. Bergman read the report, which follows.)

During the year one vacancy and one resignation from this committee necessitated the appointment of two new members, Dr. J. S. Koen being appointed to fulfill the unexpired term of Dr. Cassius Way, and Dr. J. Fleming appointed for the five-year period as B. A. I. representative on the committee. In view of the very complete examination made last year, of all the schools accredited by this association, when twelve of the fifteen schools were visited by representatives of the committee, inspections of schools this year were confined to schools either not visited last year, or where special request was made, or matters of especial educational importance involved. During the present year, 1921-1922, the following institutions have been visited by members of this committee:

Colorado State College, Division of Veterinary Medicine.

Indiana Veterinary College.

Iowa State College, Division of Veterinary Medicine.

New York State Veterinary College, New York University.

St. Joseph Veterinary College.

State College of Washington, College of Veterinary Science.

In addition to actual inspections made, complete data have been collected from all schools relative to appropriations, improved facilities in the way of buildings and equipment, student enrollment, entrance credentials of matriculants, and changes in faculty personnel. (The detailed reports on the foregoing are on file and available for examination) With apparently only one exception, all institutions on the approved list of this Association are complying with the regulations relative to entrance requirements and length of curriculum. The one exception involves the matriculation of certain Federal Board students and students to advanced standing and is being given careful attention by the Committee. In view of the rather small enrollment of students in the majority of the veterinary colleges, your committee is glad to report no decrease in appropriations for veterinary educational and research work in the various schools but rather is able to report some increases and additional and improved facilities in the way of buildings and equipment in a number of schools. Outstanding improvements the past year, or appropriations immediately available for same, may be briefly mentioned as follows:

Alabama Polytechnic Institute, College of Veterinary Medicine; new laboratory, hospital and clinic buildings totalling an expenditure of \$50,000.

Iowa State College, Division of Veterinary Medicine; additional buildings and facilities for research work including 60-acre, research farm, \$60,000.

Kansas State Agricultural College, Division of Veterinary Medicine; appropriation and plans completed for a \$100,000 hospital and clinic building.

New York State Veterinary College, Cornell University; appropriation of \$100,000 for construction of new wing to main building for offices, auditorium, library and laboratories.

Georgia State College of Agriculture, Division of Veterinary Medicine; new anatomy building.

State College of Washington, College of Veterinary Science; increased hospital and clinical facilities.

The most outstanding change in connection with the veterinary colleges, and one in which the members of this Association will be much interested, inasmuch as it involves one of the oldest schools with many alumni, not only in Canada but in the United States, is the removal of the Ontario Veterinary College from Toronto to Guelph, Ontario, the seat of the Ontario Agricultural College. The new buildings will be ready for occupancy September 1st. The main veterinary building, accommodating offices, class-rooms, laboratories, library, museum, etc., is a three-story structure costing \$250,000 exclusive of equipment. The veterinary hospital, a two-story building, situated near the main building, will cost \$30,000 exclusive of fittings. The grounds occupied by the veterinary college include fifteen acres. This committee and the entire profession congratulate the Ontario Veterinary College faculty and alumni on their new home and extend best wishes for its future success. The provision of this finely equipped institution, by the Province of Ontario, for the furtherance of veterinary education and research, reflects the importance and confidence of our Canadian friends in the veterinary profession. This is further reflected by increased facilities and improvements allowed this year at the other Canadian school, located at the University of Montreal.

Improvements in educational facilities in the various colleges such as those enumerated mean much to the veterinary profession. The foundation of any profession is its education. "A river cannot rise higher than its source." Likewise, the height to which the veterinary profession can rise depends upon its source, i. e., its educational institutions. The veterinary profession must maintain educational standards equivalent to those of other professions, if it expects to become permanently established on a plane with them. And, indeed, the educational institutions must not fail in their responsibilities. The selection, education, and graduation of young men who must ultimately carry on and maintain the prestige of the veterinary profession is a responsibility which in veterinary institutions in the past has been too lightly considered.

Likewise, the responsibilities of the veterinary colleges in connection with problems of research should be emphasized. Adequate and intelligent research is fundamental to progress in any and all sciences. Your committee is glad to

report increased interest and facilities for carrying on research work in the majority of the veterinary colleges. The decrease in number of students has given more opportunity in many institutions for the devoting of a part of the time of the faculty to research problems, which is being taken advantage of. Hence, while the graduates from veterinary colleges in the future will be fewer in number, there is no doubt but that they will be greater in ability and efficiency. The opportunity for closer association with instructor, constant contact with research work and investigational problems, together with the remarkable improvement in veterinary educational institutions in the past few years, cannot help but develop more thoroughly and broadly trained veterinarians and ultimately promote the veterinary cause.

The listed "Essentials of an Approved Veterinary College," as recommended by this Committee and adopted by the Association last year, has proven of material value to your committee in connection with the inspection of veterinary colleges. It not only outlines in definite form a fair standard which the Association believes educational institutions should conform with, but enables this committee to reply with some accuracy to the often-put question as to what constitutes the A. V. M. A. requirements of an approved veterinary college. The adoption by this Association of the proposed "essentials" was undoubtedly a progressive step in veterinary educational affairs.

With the close of the 1921-22 school year, the New York State Veterinary College at New York University has voted to suspend operations until an adequate fund may be secured for its maintenance. This institution, the oldest in the United States, has had increasing difficulties the past few years in securing sufficient financial support to enable it to meet the demands of present-day veterinary education, and to maintain the degree of educational efficiency which it desired to maintain. In April, a representative of this committee met with the Chancellor and Council of New York University, at which time matters relative to the institution were frankly discussed. Later, and upon recommendation of the Alumni Association of the College, it was decided to suspend operations temporarily, until adequate funds shall be secured to rehabilitate the college. In advising this committee regarding the action of the University, the Chancellor expressed his appreciation of the courteous attention accorded the institution by this organization and expressed a desire that the institution might again resume its association with the A. V. M. A., whenever adequate funds may be secured for its rehabilitation and proper maintenance.

During the year the St. Joseph Veterinary College, which was dropped in 1919 from the list of veterinary colleges approved by this Association, formally requested inspection by this committee with the view of again making application for reinstatement to the list of approved colleges. In March the St. Joseph Veterinary College was visited by three members of this committee, Drs. L. W. Goss, J. S. Koen, and J. Fleming. The detailed report of this subcommittee is on file and available for examination. The findings of the committee indicate that the St. Joseph Veterinary College is not meeting the A. V. M. A. educational requirements and therefore should not be included in the list of veterinary colleges approved by this Association.

Relative to student attendance in veterinary colleges the following compilation shows a total of 731 students matriculated for the session 1921-22, in the fifteen veterinary colleges accredited by this Association. In addition there were approximately 100 students attending colleges not accredited, or a total of 831 attending veterinary colleges in the United States and Canada. Of the 731 attending the high-standard institutions, 171 were freshmen. The total of freshmen shows a slight decrease from last year's total of 187. Excluding the two Canadian schools, both of which had a decrease in freshmen the past session, the total of freshmen veterinary students in the schools of the United States, session 1921-22, was slightly larger than that of session 1920-21.

The close of the 1921-22 session marked the graduation of such few students as remained in certain of the accredited veterinary colleges, who were transferred from the various private schools upon their discontinuing at the close of the 1919-20 session, the majority of which students lacked four-year-high-school credentials, their acceptance being based upon the special ruling of the A. V. M. A., at the New Orleans meeting in 1919. The beginning of the

STUDENT ATTENDANCE AT APPROVED VETERINARY COLLEGES
SESSION 1921-22

	1st Year	2nd Year	3rd Year	4th Year	Spec- ial	Total
Alabama Polytechnic Institute...	10	5	14	12	..	41
Colorado Agricultural College...	23	13	19	16	1	72
Georgia State Agricultural College	4	4	5	2	..	15
Indiana Veterinary College.....	9	13	21	30	..	73
Iowa State College.....	26	17	18	19	6	86
Kansas State Agricultural College	13	14	23	10	3	63
Michigan Agricultural College...	11	5	7	6	1	30
Universite de Montreal.....	8	8	2	4	..	22
New York State Veterinary College (Cornell).....	14	17	27	17	5	80
New York State Veterinary College (N. Y. U.).....	4	0	2	5	..	11
Ohio State University.....	14	13	24	35	..	86
Ontario Veterinary College.....	12	22	35	18	..	87
University of Pennsylvania.....	11	5	8	7	..	31
Texas Agricultural & Mechanical College.....	5	1	2	4	..	12
State College of Washington....	7	2	7	6	..	22
	171	139	214	191	16	731

1922-23 session will mark an epoch in the development of veterinary education in that the students of each class, freshmen, sophomore, junior and senior, in the approved veterinary colleges of North America will have matriculated on the basis of four years of preliminary high school work, or equivalent studies properly approved. No one can longer make a critical point that veterinary students are matriculated on a lower preliminary educational basis than students of engineering, science, law, the arts, agriculture, dentistry or pharmacy. We are finally on an equivalent basis with all except human medicine, which has advanced entrance requirements still further, the requirements being two to four years of collegiate work preceding the medical work proper.

In connection with the decreased attendance in veterinary colleges due to the increase in entrance requirements and length of curriculum, your committee has during the year given some attention to the matter of a possible shortage of veterinarians in the near future, a matter which has received considerable emphasis from certain sources. We have failed to discover any apparent total shortage of veterinarians in those sections of the country where there would be a possibility of a veterinarian prospering. There are communities where there is apparently a surplus of veterinary service, and others where proper veterinary service is lacking. In some cases there is a crowding to certain districts, leaving other districts somewhat depleted. What seems to be necessary at present, rather than a great increase in number of veterinary graduates, is a more equitable distribution of those graduating and those already in the field, the same problem that the medical profession is attempting to solve.

There are many in the profession who feel that in view of the rapid evolution of veterinary practice the past few years, that it is fortunate that the output from veterinary colleges has been materially decreased, and that when the profession adjusts itself on the new basis that the law of supply and demand will prevail. As Dean White, of Ohio, has said, "If in the next few years the number entering the veterinary profession is too small to meet the demand, the public will recognize the fact and we will again find our veterinary institutions filled." Your committee is convinced that what the veterinary profession needs in the next few years is not so much a great increase in numbers of veterinary institutions and students, but rather a continued improvement in the existing educational institutions, with a gradual increase in numbers of students in keeping with demand for services, and a continued improvement in the

educational qualifications of the students graduated. It would seem that all these are forthcoming in view of the steady improvement noted in educational institutions the past few years, as indicated by increased appropriations and facilities for educational and research work, and from reports this year from the deans of various institutions denoting increased interest in veterinary education on the part of prospective students, which means increased enrollments.

There is at the present time a tendency for some laymen associated with various agricultural organizations to infringe upon certain fields of veterinary practice. Their short-sighted and misguided efforts are in many cases due to ignorance of the complexity of many of the problems of disease control, and again largely a matter of promoting their own interests. The actual effect upon the live stock industry is ignored. Such methods cannot do other than complicate problems of disease control, with resultant injury to the live-stock industry as well as the veterinary profession.

Ultimately problems of disease control must be met and solved by the veterinary profession, and without question the services of the competent practitioner in the field will be better appreciated. Meanwhile we are in the hey-day of loose advice and propaganda by special interests in connection with animal diseases. To counteract this the veterinary profession is somewhat handicapped. Due to certain standards of professional ethics, lack of highly-financed, publicity bureaus, special agents, etc., it often looks as though the profession was doing nothing in its own behalf. It would seem as though some method might be evolved through our various local, state, and national veterinary organizations, whereby the educational requirements, scope of work, and attainments of the veterinary profession might be better brought before the public and better appreciated.

Our educational requirements cannot longer be criticized. Our educational institutions compare favorably with those of the other learned professions. Our scholastic attainments and attainments in research are recognized in the scientific world. However, our profession is young and in many places not understood. Better recognition of the profession by the live-stock interests and society is to be desired. Must it be by a slow process that this recognition be secured, or is there not some method whereby ethical publicity relative to the attainments of the veterinary profession may be brought before the public? This is a matter which needs the careful attention of state and national veterinary organizations.

SUMMARY

This committee, as a result of careful study and analysis of matters pertaining to veterinary education the past year, is able to briefly summarize its findings as follows:

(a). A continued improvement noted in the majority of institutions in teaching facilities and methods, with particular reference to improvement in laboratory and clinical facilities and a tendency toward adoption of teaching methods generally regarded by medical educators as most efficient.

(b). No decreases in appropriations due to decreased number of students, but rather increased appropriations in a number of veterinary colleges.

(c). Increased attention being given to research work in conjunction with teaching work in many institutions, a point of vital importance to the veterinary profession.

(d). A necessity for still further readjustment in veterinary college curricula in some cases, to accommodate the changes in veterinary field conditions.

(e). A necessity for a gradual increase in numbers of veterinarians graduated, trained to meet the changed problems of veterinary practice.

(f). A need for increased publicity for the benefit of the practitioner in the field, emphasizing his qualifications, capabilities, and responsibilities, to counteract the publicity of lay agencies in connection with veterinary activities.

RECOMMENDATIONS

1. This committee recommends the following veterinary colleges as approved colleges for the ensuing year:

Alabama Polytechnic Institute, College of Veterinary Medicine.
Colorado State College, Division of Veterinary Medicine.

Georgia State College of Agriculture, Division of Veterinary Medicine.

Indiana Veterinary College.

Iowa State College, Division of Veterinary Medicine.

Kansas State Agricultural College, Division of Veterinary Medicine.

L'Ecole de Medecine Veterinaire, Universite de Montreal.

Michigan Agricultural College, Division of Veterinary Medicine.

New York State Veterinary College, at Cornell University.

Ohio State University, College of Veterinary Medicine.

Ontario Veterinary College, Toronto University.

State College of Washington, College of Veterinary Science.

Texas Agricultural and Mechanical College, School of Veterinary Medicine.

University of Pennsylvania, School of Veterinary Medicine.

2. This committee recommends that the Dean of each approved veterinary college, through a representative faculty committee, take up a careful consideration of the curricula content and arrangement of his particular institution, as compared with the curricula of the other approved colleges, with the view to attempting improvement and such degree of uniformity as may seem advisable, through a meeting of the deans or their representatives with the Committee on Intelligence and Education.

3. This committee recommends that the appropriation of \$1000.00 available the past two years for the work of this committee be continued for the ensuing year.

H. D. BERGMAN, *Chairman*
(term expires 1923)

J. FLEMING
(term expires 1926)

L. W. GOSS
(term expires 1925)

J. S. KOEN
(term expires 1922)

B. T. SIMMS
(term expires 1924)

Committee on Intelligence and Education.

DR. V. A. MOORE: I move the adoption of the report.

. . . The motion was seconded . . .

PRESIDENT KINSLEY: You have heard the motion. Is there any discussion?

SECRETARY MAYO: Mr. President, I would like to ask if the Ontario Veterinary College is now affiliated with the Toronto University or the Agricultural College.

DR. TORRANCE: With the University.

DR. E. E. WEGNER (Pullman, Wash.): I didn't quite understand the second recommendation.

DR. BERGMAN: I will read it again. (Re-read the second recommendation.)

I might say in connection with this recommendation, when the Committee on Intelligence and Education, some three or four years ago, outlined a sort of progressive program looking toward the improvement of veterinary educational conditions, we felt that this program would probably run over a period of five or six years. We have made some progress, as the majority of you know. Now at that time we had in mind a careful study of veterinary curricula, because we find in the various institu-

tions a great diversity, not only in subject matter but the time requirements in connection with different subjects, sequence of subjects, etc., which makes it almost impossible, at the present time, for a student to transfer from one accredited veterinary college to another.

The American Medical Association made a study of this problem some years ago, and even went so far as to attempt to outline what they called a suggestive curriculum for medical schools. Just how closely they are sticking to the so-called suggestive curriculum, I don't know, or how far we may be able to get in connection with this prospective plan.

Dr. Moore, in a paper presented in one of the sections, emphasized the need for this very thing. If we don't get any further in conjunction with the representatives of the various institutions, than to work out some apparently logical sequence in connection with such, and possibly call the same subject matter as taught in the various institutions by the same name, we are going to make progress.

There is a demand at the present time, on the part of students, to transfer from one accredited institution to another, and they may want to specialize along some line, and that thing should be encouraged, if they desire to do it. That is the idea in this recommendation of the Committee.

Now it is the idea of the Committee to notify each Dean definitely relative to this recommendation and attempt to get this meeting probably at the time of the Sanitary Association meeting in Chicago, by which time the Deans will have had ample time to consider this thing and we will try and get together to see if any progress can be made.

PRESIDENT KINSLEY: Any further remarks or questions?

The motion to adopt the report was carried.

PRESIDENT KINSLEY: We have now two splendid selections on the literary program. The next number is "The Veterinary Profession as Observed in Various European Countries," by Dr. A. Eichhorn, of Pearl River, N. Y. Dr. Eichhorn needs no introduction; you all know him. (Applause) Dr. Eichhorn then delivered his address. (Published in the JOURNAL, January, 1923.)

Gentlemen, I only wish we had the time to discuss Dr. Eichhorn's report, but owing to the fact that our next speaker, and the one whom we have reserved for the last of the literary pro-

gram, leaves on a train within an hour. I feel it necessary to call upon Dr. John R. Mohler. (Applause)

Dr. Mohler presented his address on "Present Problems of Our Animal Industry." (Applause) (Published in the JOURNAL, February, 1923.)

PRESIDENT KINSLEY: Gentlemen, I know I speak the sentiment of all the members when I say that we appreciate very much the remarks of Dr. Mohler.

Is there any unfinished business to come before the meeting? Any new business?

DR. STANGE: Mr. President and Gentlemen: At the next annual meeting we shall ask for the adoption of the following amendments to the Constitution:

Article 3, Section 1, to read, "Members of this Association shall be of three kinds—active, honorary and junior.

"Notice is also given asking an amendment to the By-laws of all articles relating to the election of junior members; also an amendment to Article 5, regulating the initiation fee and dues of junior members."

C. H. Stange

M. Jacob

D. M. Campbell.

Gentlemen, in explanation I want to say that it is the opinion of some of us that by arranging a possible connection between veterinary students in colleges and this Association, by making them not *active* but *junior* members, and keeping them in touch with the activities and the possibilities of the Association work, that we can save much time and increase our membership by graduating the students into the Association instead of allowing them to locate and then spending a lot of money trying to get them in. We believe that it is a move in the right direction.

Mr. Chairman, I move that this be referred to the Executive Board to be considered at the next annual meeting.

. . . The motion was seconded and carried . . .

PRESIDENT KINSLEY: Any further new business?

SECRETARY MAYO: Mr. President and Members of the Association: I want to take this opportunity of thanking every individual member who has given me such cordial support. In the six years that I have occupied the Secretary's office, only two members have taken the opportunity of writing me critical letters. To one I furnished evidence and convinced him that he was wrong and he wrote a nice letter in reply. The other is of

such peculiar mentality that I didn't place much importance on his conclusions. I have made mistakes, I know, but I have tried to be square. I thank you. (Applause)

DR. TORRANCE: Mr. President, I know the members of this Association are always pleased to hear of honors or distinctions conferred by foreign countries upon members of this Association. During the past year two of our Canadian members have been so honored. Dr. J. G. Rutherford has been elected a corresponding member of the Société Centrale Vétérinaire de Médecine of Paris; and Dr. F. T. Daubigny, the Dean of the Veterinary College of Montreal, has had conferred upon him the title of Officier de l'ordre de Merite Agricole, of France. I feel sure that this distinction conferred upon two of our members might well be recognized by a resolution, and I beg to move that this Association has heard with pleasure of the distinction conferred upon two of our members, namely, Dr. J. G. Rutherford and Dr. F. T. Daubigny, from France.

PRESIDENT KINSLEY: Gentlemen, you have heard the motion and the worthy object is very evident. Is there a second?

. . . The motion was seconded and a rising vote was given . . .

PRESIDENT KINSLEY: Just before installing the incoming officers, I wish to thank all of the officers who have so finely cooperated with the Executive Board of this Association. I wish to thank personally each one who has taken part in the program of this convention, and I wish to thank personally each member for his kind attention and particularly for the large number who still remain at the close of the convention.

Next in order will be the installation of the new President-elect, and I will ask Dr. H. B. Treman, of Iowa, and Dr. T. J. Foster, of Illinois, to escort the President-elect Dr. Welch, to the platform.

. . . Dr. Treman and Dr. Foster escorted Dr. Welch to the platform . . . (Applause)

PRESIDENT KINSLEY: Gentlemen, your new President needs no introduction. It has been a custom for many years for the outgoing President to present to the incoming President this gavel. This gavel was presented to this Association twenty years ago at the convention in Minneapolis. Dr. Welch, I present this gavel to you as the emblem of the American Veterinary Medical Association. I hope you will have as much pleasure

in the conduct of your office as I have had during my stay therein. (Applause)

I think the new President should give us just a few remarks now. .

PRESIDENT-ELECT WELCH: Fellow-members, I think that I shall not take up a great deal of your time. I think perhaps you are mostly all in the same shape I am—you would like to get out of here and catch a train as quickly as possible.

However, I am certain from the many sentiments that have been expressed to me since my election that I shall have the hearty cooperation of the majority of the Association, and that is what we need in this Association—close cooperation, that is what spells success.

As Kipling so beautifully put it,

*"It is not the individual
Nor the army as a whole,
But the everlasting team-work
Of every bloomin' soul."*

Our Association, in the coming year, will be a success if you members make it such. It so often happens that when you have elected your officers you step aside and leave most of the work upon their shoulders, thinking that your duty has been performed. Not so. If this Association is a success during the ensuing year, it will be through your endeavors as much as through the officers'. Gentlemen, I thank you. (Applause)

PRESIDENT KINSLEY: Of the Vice-Presidents elected, I see only Dr. Hart. Will Dr. Turner and Dr. Goss conduct Dr. Hart to the rostrum?

. . . Dr. Hart was escorted to the platform . . .

PRESIDENT KINSLEY: Gentlemen, you are perfectly acquainted with your Vice-President, Dr. Hart. I presume he has some remarks.

DR. HART: I wish to thank you very much, gentlemen, for the honor you have conferred upon me in electing me to this position. I feel somewhat, in carrying out the duties of this position, like the man who was acting as assistant to one of the shipyard workers during the war, in the shipyard in which they were working on the cost-plus basis. This man went to the shipyard and received employment, and when turned over to the foreman he was given a hammer and told to walk around through the various parts of the plant and see what was going

on, and that was all he needed to do. He did that for several days, when he came upon the man who gave him the employment. The man asked, "How are you getting along?"

"Very satisfactorily, except there is another man following me around doing the same thing I seem to be doing, and he seems to be keeping very close tab on me."

The foreman said, "Don't worry about the man, he is your assistant." Now I expect to make a good assistant in that way to the Third Vice-President.

I thank you very kindly. (Applause)

PRESIDENT KINSLEY: Dr. Marsteller, will you conduct Dr. Hoskins to the platform, please?

. . . Dr. Marsteller conducted Dr. Hoskins to the platform . . . (Applause)

PRESIDENT KINSLEY: Your new Secretary and combination officer—soon.

DR. HOSKINS: Gentlemen, you heard this Ford snort around last night, and I am not going to delay you with another address at this time. Dr. Mayo said he made mistakes, and I expect to make mistakes. It is frequently said that the person who makes no mistakes never accomplishes anything.

I am fully aware of the fact that I have a big job on my hands, and I want to thank the men who have come up to me and wished me well and told me that they were in back of me and wanted to know if there was anything they could do. I will enter upon my new duties with the thought that I have the unanimous backing of every single member of the Association.

I thank you. (Applause)

PRESIDENT KINSLEY: Is Dr. Jacob in the room? His election has been a chronic affair and I presume we can pass over it.

Gentlemen, if there is nothing further the convention will stand adjourned.

. . . The meeting adjourned at twelve o'clock . . .

ADJOURNMENT

(To be continued.)

DR. TOBIAS TO SIOUX CITY

Dr. D. D. Tobias (Chi. '10), formerly State Veterinarian of Nebraska, resigned his position March 1st. He is now connected with the Sioux City Serum Company, in the capacity of sales and field work.

ORGANIZATION OF THE AMERICAN VETERINARY MEDICAL ASSOCIATION

1922-1923

OFFICERS

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OTHER MEETINGS

NATIONAL ASSOCIATION OF B. A. I. VETERINARIANS Metropolitan Division

A meeting of the Metropolitan Division of the National Association of the Bureau of Animal Industry Veterinarians, was held at the Academy of Medicine, New York City, on Friday evening, January 26, 1923.

Through the courtesy of Dr. John R. Mohler, Chief of the Bureau of Animal Industry, Dr. B. H. Ransom, Chief of the Zoological Division, was present and delivered an address, illustrated with lantern slides, on "Parasites with Particular Reference to Meat Inspection."

The Academy of Medicine hall had been selected for this occasion on account of its ample capacity. Practically the entire membership of the Division was present, in addition to members of the New York County and the New Jersey State Veterinary Medical Associations, invited as guests.

The address was very interesting and instructive and much appreciated. At its conclusion Dr. Ransom kindly answered the questions put to him by the various members. These questions related particularly to post-mortem work and to specimens which had been brought to the meeting for demonstration.

In behalf of the members of the division and their guests, Dr. Albert Long, President of the Division, extended to Dr. Ransom the thanks of the members for his able and instructive talk.

E. L. SANDER, *Secretary-Treasurer.*

PHILIPPINE VETERINARY MEDICAL ASSOCIATION

The eleventh annual meeting of the Philippine Veterinary Medical Association was held in Rizal Hall, University of the Philippines, Manila, P. I., on February 12 and 13, 1923.

The first session of the meeting was called to order at 9:15 a. m., by the President, Dr. Harry F. Kern. Upon motion duly seconded the minutes of the last meeting were unanimously approved, as published in the veterinary number of the Philippine Agricultural Review, in 1922. Dr. Cipriano San Diego, a graduate of the College of Veterinary Science, class of 1922, was admitted to membership.

The financial condition of the Association was reported by the Secretary-Treasurer, as passed by the Committee on Finance. Upon motion duly seconded this report was unanimously approved.

The Secretary then read the following resolution in memory of our late member Dr. James B. Ashcraft, which was approved:

WHEREAS, Dr. JAMES B. ASHCRAFT, was elected to membership in the Philippine Veterinary Medical Association, February 4, 1921; and

WHEREAS, he was an active and inspiring promoter in the progress of this Association; and

WHEREAS, God in his great wisdom, willed it that we be deprived of his warm firendship and valuable assistance in the progress of veterinary medicine in the Philippine Islands; be it, therefore,

RESOLVED by the Philippine Veterinary Medical Association, as it is hereby resolved in this 14th day of our Lord, to unanimously convey our sympathy to the family of the deceased for this irreparable loss; and, be it further

RESOLVED, that copies of this resolution be spread in the minutes of the Association, and sent for publication to one local paper and to the JOURNAL OF THE AMERICAN VETERINARY MEDICAL ASSOCIATION.

The attention of the Association was called by the Secretary to an advertisement in the December 1922 issue of "The Veterinary Journal," edited by Dr. Frederick Hobday, in London, England, with reference to a veterinary correspondence college offering degrees in M. R. C. V. S., B. Sc., B. V. Sc., D. V. H., F. R. C. V. S., M. V. Sc., and D. Sc. Dr. Manresa moved that the Secretary be instructed to write a letter to the Secretary of the A. V. M. A., inviting his attention to this flagrant announcement, published in a supposedly scientific magazine.

The annual address of the President was rife with instructive and inspiring thoughts. He concisely reviewed the different fields of activity and the future possibilities of service of the veterinary profession in the Philippines.

Dr. Gomez moved that the President appoint a committee of three to convey to the Legislature the indorsement of the Association for the early approval of the Castration Bill. Dr. Gison seconded. Motion carried. The President appointed the following: Dr. San Agustin, Chairman; Dr. Lecaros, and Dr. Schultz.

There being no further business, the meeting adjourned at 12:30 p.m. to meet the following day.

The second session of the meeting was called to order by the President at 9:20 a. m. the following day. The first speaker was Dr. S. Youngberg, Chief Veterinarian. His topic was "The Present Status of the Veterinary Profession." He recited his impressions obtained from his recent trip to the United States, having met such prominent men in the veterinary profession as Dr. W. H. Welch, President of the A. V. M. A., Dr. A. T. Kinsley, Dr. L. A. Merrilat and others. He briefly reviewed the development of the different professions, saying that the veterinarian is the youngest of all his co-professionals. His services are required on a strictly economic basis.

At the present time, Dr. Youngberg continued, the veterinary profession is passing through a transition stage due to the financial crisis. To a large extent locomotive power is replacing horse power in the larger cities of the East and as a consequence a great number of practitioners, who have been for years devoting their attention to horse practice, have lost all anchor, as it were, in the sea of their activities. However, the dairy industry is being developed rapidly in the cities.

In the agricultural sections of the West, the swine and cattle industries are at the height of their development. From authentic sources however, Dr. Youngberg reported that it is the general opinion that the veterinary profession in the United States is actually crowded. He claimed that in the Philippines the field of activity of the veterinary profession is as yet limited, and consequently it will necessitate a great deal of pioneering work in this line. He suggests that we should work for the creation of provincial veterinarians, to be paid by the province employing them, as due to the low financial condition of the government, insular positions are not easily provided for.

Dr. San Agustin moved that a committee of three be appointed by the President, with the Chief Veterinarian as Chairman, to investigate and report to the Association the possible avenues of opportunities for the veterinary profession in the Philippines. The motion was carried and the President appointed the following: Dr. Youngberg, Chairman; Dr. San Agustin and Dr. Gison.

The next speaker was Dr. Gearhart, owner of a large dairy farm. He spoke on "Indian Cattle and Buffaloes as Dairy Animals." It was a good defense for these animals, as being

the ideal ones for a dairy farm in the Philippines. The advantages in their favor are the following: (1) They are hardy and can stand the storms and wind in the pasture. (2) They can feed on rough and coarse feed. (3) The offspring find a good and ready market. (4) They are resistant to diseases, especially to rinderpest and tuberculosis.

The meeting adjourned at 12:30 p.m. and reconvened at 2:25 p. m., the President again calling the meeting to order.

In place of Dr. Alano, who was absent, Dr. Kern briefly summarized the important parts of his topic, as he is acquainted with the epidemic of anthrax in Laguna province.

After the discussions the election of officers was held. Dr. Manresa moved to re-elect the officers *in toto*. Dr. Lacaros seconded. Motion was carried unanimously. The meeting adjourned at 3:30 p. m.

A. K. GOMEZ, *Secretary-Treasurer*.

IDAHO VETERINARY MEDICAL ASSOCIATION

The third annual meeting of the Idaho Veterinary Medical Association was held at Boise, Idaho, February 18, 1923, with a total attendance of thirty-five. The morning session was opened with a few remarks of greeting from the President, Dr. Ray B. Hurd, introducing the Hon. E. B. Sherman, Mayor of Boise, who gave a very cordial address of welcome, which was responded to by Dr. W. C. Nye, of Rigby, Idaho.

Dr. Charles F. Ensign, of the Public Health Service, Boise Barracks, gave a very interesting lecture on some of the problems of tuberculosis control, detailing especially the difficulties met by the medical profession, in trying to control the spread of this disease, with significant reference to the progress made in recent years in establishing certain facts concerning the transmissibility from domestic animals to the human; commending very highly the Idaho Veterinary Medical Association in its splendid cooperation with the State and Federal Bureaus and all Public Service organizations, especially the tuberculosis eradication work; recognizing the many problems the medical and veterinary professions have in common, relative to the control and eradication of the many diseases transmissible from animals to man, and vice versa.

In his lecture on "Veterinary Medicine, as Influenced by Recent Discoveries," Dr. Otto Menig, of the Washington State College, brought out many interesting things which will give the

profession much food for thought. Dr. Menig is strictly a Western veterinarian, and through actual practice and his connection with the Washington State College, as Professor of Veterinary Medicine, has become thoroughly familiar with Western live stock conditions relative to live stock diseases and their control and is considered an authority on these matters.

Dr. Menig discussed at length the important scientific discoveries that have practical bearings upon veterinary practice, centering his remarks on the relationship of life to its environments, and the importance of the therapist recognizing this factor and meeting the conditions of environment, for the purpose of preserving and maintaining the animal's vitality and resistance to disease and conditions adverse to health and normality.

Prof. E. F. Rinhart, of the University Extension Bureau, addressed the meeting on the subject of "Animal Husbandry Problems." Prof. Rinhart is a thorough student of animal husbandry, with many years of experience in both East and West, and presented these problems to the veterinarians in a very practical and masterly way. He is in closer touch with the live stock people of the State, perhaps, than any one other individual employed in the various Public Service organizations. Likewise he is in very close touch with the veterinary profession, recognizing that veterinary practice and animal husbandry are in very close relation to each other. Mr. Rinhart is well known to the veterinarians of Idaho and is held in high esteem by them.

The minutes and Secretary's report of the last annual meeting were read and approved. The report of the Executive Board on the election, by ballot, of the officers was read and approved, announcing the election of the following officers for the ensuing two years: President, Dr. Ray B. Hurd, Payette; Vice-President, Dr. J. E. McCoy, Twin Falls; Secretary-Treasurer, Dr. J. D. Adams, Boise; Executive Board (for a term of two years), Dr. W. R. Kidwell.

The afternoon session was opened by the President with his annual address. In his usual jovial manner, Dr. Hurd very ably portrayed the inception, development and progress of the present Association, and the high standard which the profession has attained, impressing on the minds of the members the necessity of lending every aid and support to the organization.

Then followed each number, as scheduled on the program, followed by discussions. Dr. Chas. Seagraves, of Coeur d'Alene,

reviewed the subject of "Genetics," which was discussed with much interest. Busy practitioners have little time to devote to these subjects and those in attendance took great interest in refreshing their minds on some of the main points in Mendel's theory.

Dr. J. C. Sorensen, of Idaho Falls, gave a splendid paper on "Mastitis." Interesting and instructive discussions followed on the different kinds of mastitis, with special consideration given to the catarrhal form. The subject, "The Duty of a Veterinarian in his Community," was very ably presented by Dr. A. J. Powell, of Lewiston, Idaho, and met with responses of approval from the members present.

Dr. S. E. Nelson, of Preston, Idaho, was not able to be present. His paper, "Veterinary Anesthetics," was read by the Secretary and was discussed with much interest by the members present. Dr. W. C. Nye, of Rigby, Idaho, presented a very fine paper on "Different Types and Breeds of Farm Animals;" pointing out the necessity of the present-day veterinarian being familiar with breeds and breeding, with relation to local conditions of environment and adaptability of different breeds and different crosses to such conditions.

The evening session was given over to the discussion of Dr. McCoy's paper on "Abortion Disease and its Sequelae." There was much interesting and instructive discussion of the different phases of diagnosis, treatment and control of this disease. Committee reports were received and approved and the President announced the appointment of standing committees for the ensuing year.

It was decided that the next annual meeting would be held at Lewiston, Idaho, some time in May or June, 1924, the exact date to be determined later. It was also decided to hold a mid-year meeting, at Idaho Falls, some time in August of this year, at which meeting the program would be principally clinics. A unanimous vote of thanks and appreciation was given to those appearing on the program and an honorary membership in the Association conferred upon Dr. Menig.

There being no further business to come before the House, the meeting adjourned *sine die*.

J. D. ADAMS, *Secretary*.

NORTHWESTERN AND CENTRAL WISCONSIN VETERINARY MEDICAL ASSOCIATION

A joint meeting of the Central and Northwestern Wisconsin Veterinary Medical Associations was held at Marshfield, March 6th, 1923. Owing to the light attendance in the morning the business session was put over until evening, and the clinic was held in its place. The clinic held at the hospital of Dr. A. J. Abbott, was very large and proved to be one of the best held for some time, all the forenoon and afternoon being taken up with it.

As we had the pleasure of having Dr. L. A. Merillat, of Chicago, with us for the day, he was persuaded to do the major part of the operating and as usual he rose to the occasion and met it more than half way. It did some of his former students good to see him again in action and talking at the same time. At 7 p.m. a banquet was held at the Hotel Blodgett, at which about forty members and their wives attended. After the banquet a business meeting was held and under the head of "Good of the Associations," the afternoon and evening programs were taken up.

It was with regret that we learned from Dr. Merillat that Dr. C. A. Zell has been taken suddenly ill and was unable to appear on the program. With other slight exceptions the program was carried out in full. Those taking part included Drs. W. F. Nolechek, of Thorp; J. R. Fessler, of Bruce; S. E. Cottrill, of Wisconsin Rapids, and W. W. Payne, of Colby. At the conclusion of the program, a rising vote of thanks was extended Dr. Merillat for his work in the clinic and the fine talk we had just listened to.

The following officers were elected for the ensuing year: President, Dr. James O'Donnel, Owen; Vice-President, Dr. G. A. Mills, Wausau; Secretary-Treasurer, Dr. W. R. Swan, Stevens Point. All members present expressed themselves as more than pleased with the meeting and regretted only that there were not more present. The next meeting will be held at Stevens Point, in August.

W. R. SWAN.

B. A. I. VETERINARY INSPECTORS' ASSOCIATION OF CHICAGO

The following is a report of the meetings held during the past month by the school of instructions for the veterinary inspectors, which meets in the Government Office of one of the local plants each Monday morning. The Chicago Branch of the National

Association of Bureau of Animal Industry Veterinarians prepares a program for several weeks in advance on various subjects relating to meat inspection. Pathological specimens of interest, as well as rare conditions found by the inspectors, are collected during the week and presented to the meeting for diagnosis and discussions.

On March 12, 1923, Dr. J. A. Molengraft, read a paper on "Milk and its relation to Public Health."

On March 19, 1923, Dr. J. S. Bengston, read a paper on "Botulism."

On March 26, 1923, Dr. O. Hornlein, gave a talk on "Discolorations of Organs and Tissues as Related to Meat Inspection."

On April 2, 1923, Dr. H. B. Raffensperger, gave a talk on "Parasites of Food-Producing Animals."

On April 9, 1923, Dr. W. N. Neil, gave a discussion on "The Work of the Bureau of Animal Industry Outside of the Meat Inspection Division."

L. T. HOPKINS, *Secretary*

MAINE VETERINARY MEDICAL ASSOCIATION

The Maine Veterinary Medical Association met at the Bangor House, Bangor, Maine, April 11, 1923, at 7 p. m.

The Legislative Committee reported the passage of an act regulating the practice of veterinary medicine in Maine, and another act directing the Board of Veterinary Examiners to issue a certificate to a Canadian citizen who refused to write the required examination, on the grounds that he never had studied at any college and was not familiar with the technical terms. More power to the Legislature.

Dr. F. L. Russell, of the University of Maine, spoke regarding the control of abortion disease. He advised the thorough cleaning up of infected herds and taking the losses, rather than half-way measures, and that we as veterinarians should advise vigorous treatment. He did not outline any particular method.

Dr. J. B. Reidy, in charge of Tuberculosis Eradication in the State, made a few remarks in regard to the testing of accredited herds. He advised the accredited veterinarians to charge reasonable fees, in order to encourage the maintenance of accredited herds.

Dr. C. L. Ryan presented a paper on "Eversion of the Uterus

in Cattle." The paper was well written and also thoroughly discussed.

Dr. H. W. Jakeman, of Boston, was the main attraction of the evening. His talk on "Modern Biological Therapy" was well calculated to revise some of our pet theories, upset some of our sure "dope" and cause an increased amount of interest in this interesting field of disease treatment. He said, in part that biologics are abused and misused; active and passive immunity are the basis of all biological therapy; the veterinarian should know the contents of the agents he used, and what they are expected to do. Dr. Jakeman urged the practitioner to keep abreast of the times, but not to be carried away by the over-enthusiasm of commercialism.

The place and program of the next meeting were left to a committee of three.

P. R. BAIRD, *Secretary*.

SOUTHEASTERN MICHIGAN VETERINARY MEDICAL ASSOCIATION

The regular quarterly meeting of the Southeastern Michigan Veterinary Medical Association was held in Detroit, Michigan, Wednesday, April 18, 1923. The members assembled at the Army and Navy Club at 5:30, where about an hour was spent in visiting. At 6:30 dinner was served to forty-two members and visitors. The business and literary program was held in the new quarters of the Detroit Department of Health, through the courtesy of Dr. H. H. Sparhawk, who had charge of the arrangements.

The meeting was called to order by President Carpenter at 8:00 o'clock. The first speaker to be called upon was Dr. B. J. Killham, State Veterinarian, who reported the status of the several bills of interest to veterinarians pending before the Legislature. He urged the active assistance of all the veterinarians of the State in the efforts to defeat the Farmer Vaccination Bill. Dr. Killham called attention to the fact that the proposed bill was modeled very closely after the Iowa law, and that there was absolutely no call for any such legislation in Michigan.

Dr. J. E. Wurm, of Pigeon, President of the Michigan State Veterinary Medical Association, was the next speaker. Dr. Wurm outlined the activities of the Board of Directors and Legislative Committee of the State Association, in an effort to

defeat the Farmer Vaccination Bill. Dr. Wurm gave some advance information on plans for the summer meeting to be held at East Lansing, the last week in June. It was his desire that the program for this meeting be of such a character that no practitioner could afford to stay away. To this end he asked for volunteers for the program, as well as suggestions of subjects that it would be desirable to have presented. A very vigorous campaign is about to be launched to enlarge the membership of the State Association.

Dr. H. H. Sparhawk, Chief Veterinarian of the Detroit City Board of Health, reported what had been done by the local veterinarians to secure the defeat of the Farmer Vaccination Bill.

Mr. F. V. Hawkins, of Pitman-Moore Company, Indianapolis, was present as a guest and was asked to address the Association on legislative activities in other states. Mr. Hawkins reported his observations on the effects of the law now operative in Iowa, as well as conditions in several other states. Mr. Hawkins dwelt upon the need of greater publicity for the veterinary profession and the value of competent veterinary service for our immense live-stock industry.

The speaker of the evening was Dr. E. W. Porter, Assistant Pathologist, State Serum Institute, Reynoldsburg, Ohio. His topic was "Hog Cholera." Dr. Porter has been engaged in hog cholera work almost exclusively for more than ten years, and he was able to give the veterinarians present some very valuable information and helpful advice in connection with vaccination. With the aid of charts he gave the results of a series of experiments conducted at the Ohio State Serum Institute, with a view to shedding additional light on the several moot questions in connection with hog cholera and the use of serum.

Experiment No. 1 was designed to determine the effect, if any, on the potency of anti-hog cholera serum that had been subjected to freezing.

The results of this experiment indicated that the potency of the serum had not been impaired.

Experiment No. 2 had for its object to determine the part played by the birds in the dissemination of hog cholera virus. In this experiment the symptoms of cholera developed in the exposed pigs nine days after visible symptoms were exhibited by pigs artificially infected and which were intended to be the

source of the infection to be dissiminated by the fowls used in the experiment.

Experiment No. 3 was conducted to compare the virulence of whole and centrifuged virulent blood, at different intervals after the addition of the preservative, in this case phenol. The result of the experiment was to show that there was no apparent difference in virulence, as late as sixty-eight days after the addition of the preservative.

Experiment No. 4 was conducted with an idea of getting some data on the possibility of producing active immunity by administering serum-alone and following with the virus at different intervals. It would appear from Dr. Porter's work that this is a method which has much promise under certain conditions. It was brought out in this experiment that the passive immunity will persist for approximately five weeks, but is lost in a number of instances by the sixth week.

Experiment No. 5 was designed to throw light on the value of using anti-hog cholera serum as a curative agent. The outcome of this experiment indicated that serum, administered in curative dosage, will save a majority of the hogs treated in the early stages, but cannot be relied upon if treatment is postponed until after the appearance of symptoms.

The discussion on Dr. Porter's paper was opened by Dr. H. M. Newton, in charge of Hog Cholera Control in Michigan. The discussion was entered into by a large number of the veterinarians present; in fact, the subject proved to be so interesting that it was along toward midnight when President Carpenter called the discussion to a close.

The only business transacted was to re-elect all of the officers for another term.

H. PRESTON HOSKINS, *Secretary-Treasurer.*

GOING TO EUROPE

Dr. S. Sisson (Ont. '91) of the Ohio State University, is planning to make a trip to Europe this summer.

Dr. G. E. Jorgenson (McK. '15), of Clermont, Iowa, who has been doing post graduate work at Cornell University during the past year, is planning on a trip to Europe during the coming summer. Mrs. Jorgenson will accompany him. She expects to study music at the Conservatory while Dr. Jorgenson is pursuing his further studies at the University of Copenhagen.

COMMUNICATIONS

THE CHICAGO JOINT MEETING

TO THE EDITOR:

At the St. Louis meeting, last August, the Special Committee on Closer Affiliation with State and Provincial Associations, with its report, submitted plans for the revision of the Constitution and By-Laws. It was recommended in this report that provisions be made for the publication of the Constitution and By-Laws, which were attached to the report, so that they could be thoroughly studied by every member of this Association; also that the President appoint a Special Committee, to study the details of the plans submitted, in conjunction with the Executive Board.

The report was adopted in full by the Association, and President Kinsley appointed a Special Committee relative to this revision, as per adoption of the Committee Report.

When the Special Committee met the Executive Board last December, in Chicago, the purpose should have been to consider, jointly, the proposed plans for the revision of the Constitution and By-Laws as recommended in the Special Committee Report submitted and adopted at St. Louis, for the reason that a committee is strictly bound by the instructions received from the assembly, and has no power to modify them.

By ignoring the proposed plans for revision of the Constitution and By-Laws, as submitted at St. Louis, the action of the Joint Committee, in Chicago, became irregular, and in presenting a new set of proposed amendments as substitutes, this Joint Committee usurped authority not vested in a committee appointed to "study the details" of plans already submitted.

The first Special Committee, after much study and consideration, offered a proposition for reorganization in strict compliance with the provisions of the present Constitution and By-Laws. This Committee sensed the general feeling of unrest prevalent among veterinarians. Communications submitted gave evidence that the consensus of opinion is that the national association could and should do much more for its members than has been done in the past.

Leaders in our profession, more than a decade ago, suggested similar plans for reorganization, and I dare say it would have been better for the Association and for the veterinary profession

as a whole, had those plans been adopted. The number of years during which this matter has been under consideration, with no results, is sufficient to indicate that something more is required than making mere proposals and suggested amendments, such as were presented at the Chicago joint meeting.

The definite proposal for reorganization, offered by the first Special Committee, is still waiting to be acted upon by the Committee appointed at St. Louis, and steps will be taken to call another meeting of this Committee before the Association meets at Montreal.

J. H. McLEOD,

Chairman Committee on Revision.

Charles City, Iowa, March 19, 1923.

PROPOSED CHANGES OF CONSTITUTION AND BY-LAWS

TO THE EDITOR:

It is rather surprising to note some of the proposed changes in the Constitution and By-Laws, as published in the March issue, and to note the absence of any mention of the subject that the distinguished committee was supposed to have been appointed to provide for, that is, the closer affiliation between state and local associations and the A. V. M. A. Last year there was a great appeal for such a change. Now the subject appears as dead as King Tut, without even a tomb to commemorate it.

There are a few facts that every member of the A. V. M. A. should consider. The Constitution and By-Laws should be liberal and should provide the needed latitude for ordinary events. The Association can go forward and do good work. One of the first defects of the plan is the proposition for *six* vice-presidents. We have five now and that is four too many. One vice-president is all that is necessary. The others are purely ornamental, that is, they are supposed to be. Over-officering the Association is a handicap to its progress.

Another proposed change is that the president shall be elected by postal card vote. If the members knew the political combat that goes on in the election of the members of the Executive Board, they would surely kill this new monstrosity. The greatest objection to this plan is that it will operate against the practitioner, *as a man who does not have a national or international*

reputation will stand about as much chance of election as he would for president of the United States.

So far as known no notice in writing has been presented to the Association, as required by our present Constitution and By-Laws, to change the method of electing the president or to provide for more vice-presidents, etc. Until this has been done the recommendations of the committee are purely entertaining.

N. S. MAYO.

Chicago, Ill., March 24, 1923.

TO THE EDITOR:

TWO CORRECTIONS

In reading the proceedings of the A. V. M. A. annual meeting held in St. Louis, Mo., I notice in the April number a few errors by the stenographer in taking down the talk I gave on Ascarids in pigs.

I believe there are two you should correct in the May number. On page 105, second line from the bottom, it should read 39° C instead of 37° C. Also on page 108, fourth line from bottom should read "We can obtain early cleavage in a 70% alcoholic solution and complete development in a 10% dichromate of potassium solution, etc."

I will thank you to make mention of those changes in the May number, as I think they are of scientific importance.

H. B. RAFFENSPERGER.

Chicago, Ill., April 14, 1923.

The Schuylkill Valley (Pa.) Veterinary Medical Association has made a gift of twenty-five dollars to the University of Pennsylvania to be awarded as a prize to the student in the Veterinary School who obtains the highest grade in Milk Hygiene during the present session.

A new law has recently gone into effect, in the State of Pennsylvania, whereby the funds collected for dog taxes will be used to carry on the work of the Bureau of Animal Industry in the Keystone State.

NECROLOGY

DR. JESSE APPLIN DELL

Dr. J. A. Dell, of Los Angeles, Cal., died March 28, 1923, at the age of 65 years. He had not enjoyed good health for some time. Death was attributed to arterio-sclerosis. Dr. Dell was a graduate of the Ontario Veterinary College, class of 1881. Following graduation Dr. Dell located at Ann Arbor, Michigan, and practiced there for a number of years. He was a charter member and first Secretary of the Michigan State Veterinary Medical Association, and at the meeting held about two months ago he was made a life member of the Association.

About twenty years ago Dr. Dell left Ann Arbor to go to California, and located in Los Angeles, where he established a fine practice. He was a member of the California State Veterinary Medical Association, and of the Southern California Veterinary Medical Association. He was President of the latter body at the time of his death, having presided at a meeting only one week previously. Dr. Dell joined the American Veterinary Medical Association in 1910.

The profession of California and the country at large has lost one of its most loyal and unselfish members. Every member of the profession who came in contact with him called him friend. His high ideals of professional ethics and square dealing placed him above the common designation of competitor.

Dr. Dell was of the old school, which did so much to place our profession where it is to day. Competent, courteous, loyal, unselfish, an ornament to his profession, he has set a high standard for younger men to emulate, even under the improved professional conditions that they enjoy today.

Dr. Dell is survived by his widow and two sons.

DR. CHARLES J. WAIDNER

Dr. Charles J. Waidner, of Hellertown, Pennsylvania, died on March 15, 1923, of heart disease, following an illness of three months. Dr. Waidner was a graduate of the New York College of Veterinary Surgeons, and located in Hellertown immediately after his graduation. He was about 62 years of age and is survived by a widow, a daughter, and a son. Dr. Waidner was a member of the Pennsylvania State Veterinary Medical Association.

DR. ONESIMUS G. ATHERTON

Dr. O. G. Atherton died at Fort Wayne, Ind., on April 2, 1923. Dr. Atherton was born at Maysville, Kentucky, April 13, 1846. At the age of sixteen he enlisted in the Union Army and served throughout the war. He conducted a drug store in McLean County, Illinois, from 1874 to 1891, during which period he served as postmaster for one term. Dr. Atherton was a graduate of the Kansas City Veterinary College, class of 1893.

Following graduation Dr. Atherton practiced in Kansas City, Kansas, until November 1896, at which time he entered the service of the Bureau of Animal Industry as Veterinary Inspector. He retired August 1, 1920, under the Retirement Act. His first wife died in 1896 and he remarried in 1912. He is survived by his widow and four children, Dr. I. K. Atherton, Inspector in charge of hog cholera work in Maryland, being the oldest. Dr. Atherton joined the American Veterinary Medical Association in 1909. Interment took place at Bloomington, Illinois.

DR. HARRY TUBBS McNEAL

Dr. Harry T. McNeal died November 8, 1922 at Sunbury, Pa. Death came suddenly and was attributed to heart trouble, as he suffered from this affliction for a number of years. Dr. McNeal was born December 13, 1867 and received his veterinary training at the Ontario Veterinary College, from which institution he graduated with the class of 1895. He practiced in Milton, Pa., for fifteen years, later removing to Sunbury where he practiced for five years.

In 1914 Dr. McNeal accepted a position with the Pennsylvania Bureau of Animal Industry, which position he held at the time of his death. Dr. McNeal joined the American Veterinary Medical Association in 1916. He was also a member of the Pennsylvania State Veterinary Medical Association and the Central Pennsylvania Veterinary Club. He was a member of the F. and A. M. Lodge, of Shickshinny, Pa. Dr. McNeal was a hard and diligent worker and had a host of friends among his colleagues. His loss has been keenly felt by those who knew him best. He is survived by his widow. Interment took place at Shickshinny, Pa., the place of his birth.

DR. DANIEL EMERSON

Dr. Daniel Emerson, of Hollis, New Hampshire, died on January 15, 1923, death being due to cancer of the pancreas. Dr. Emerson was a graduate of the Harvard University Veterinary School, class of 1888. Following graduation Dr. Emerson practiced for a great many years at Lynn, Mass. In 1920 he relinquished active practice and moved to Hollis, New Hampshire, where he took up farming. Dr. Emerson was one of the oldest members of the American Veterinary Medical Association, having been in good standing continuously since his admission to membership in 1888. Following the custom which was in vogue in the Association at that time, he received the title of "Fellow" in 1913, upon the completion of twenty-five years of membership.

DR. EDWARD DANIEL LEACH

Dr. Edward D. Leach, formerly of Fort Wayne, Ind., died on February 16, 1923, after a long illness. Dr. Leach was a graduate of the Chicago Veterinary College, class of 1908, and practiced in Fort Wayne, Ind., up until about two years ago, at which time he was taken sick and was obliged to enter a sanitarium for treatment. Dr. Leach joined the A. V. M. A. in 1913. He is survived by a sister, Miss Sarah A. Leach, 3327 Parkview Ave., Pittsburgh, Pa.

DR. HARRY LOUIS ALDERMAN

Dr. Harry L. Alderman died April 3, 1923, at his home, 132 Massachusetts Avenue, East Lexington, Mass., after an illness of several weeks, due to hardening of the arteries. Dr. Alderman was born in East Lexington, Mass., November 29, 1859. He attended the common schools and later entered Harvard University. His veterinary training was secured in the American Veterinary College, of New York City, from which institution he was graduated in 1883. Since that time he has practiced in Lexington. Dr. Alderman was an inspector of animals in Lexington for many years. He was a member of the Metropolitan Driving Club. He is survived by his widow and a sister.

DR. CLIFFORD GILCHRIST

Dr. Clifford Gilchrist, of Grinnell, Iowa, died on January 12, 1923, as the outcome of an attack of appendicitis. Dr. Gilchrist was a graduate of the Iowa State College, class of 1914, and was in partnership with his older brother, Dr. Willard D. Gilchrist, at Grinnell. Dr. Gilchrist had three and one-half years of service to his credit in the Army, having been discharged with the rank of Captain.

PERSONAL

Lt. Lloyd C. Ewen (U.P. '17) is stationed at Ft. Ethan Allen, Vt.

Dr. A. Sanders Jr. (Chi. '08) has been appointed postmaster at Stephenson, Mich.

Dr. O. J. Osborn has removed from Whittier, Cal., to 1300 N. Lake Ave., Pasadena, Cal.

Dr. C. F. Pauly, (McK. '18), formerly of Canajoharie, N. Y., is now located at Kirkwood, Ill.

Dr. R. H. Mohlenhoff (Chi. '91) of Cleveland, Miss., is planning to attend the meeting at Montreal.

Dr. Wm. A. Giffen (Ont.) of Detroit, Mich., is President-elect of the American Dental Association.

Dr. C. J. Marshall (U.P. '94) addressed the Conestoga Veterinary Club, at Lancaster, Pa., on April 15th.

Dr. J. C. Burneson has left Richmond, Ky., and is now located at 1749 West Pershing Road, Chicago, Ill.

Dr. L. T. Langland (Iowa '22), formerly of Cambridge, Iowa, is now located at 241 Maple St., Waterloo, Iowa.

Dr. A. H. Moody (Ont. '85) of Three Rivers, Mich., has retired from practice. He is nearly 70 years of age.

Dr. E. F. Pile (Kan. '16), of Liberal, Kan., has filed a Government claim at Casper, Wyo., where he is temporarily located.

Dr. A. G. Griesbach (Cin. '16) has removed from Berthoud, Colo., to Denver. He gives his address as 709 East Eighteenth Ave.

Dr. H. W. Hawley (Chi. '91) has been transferred as Stock Yards Supervisor from Sioux City, Iowa, to Los Angeles, Cal.

Dr. C. M. Grubb (Geo. Wash. '11) of Rockville, Md., is Dairy Inspector for the Health Department of the District of Columbia.

Dr. Joseph Hawkins (Ont. '71), of Detroit, Mich., who has spent the winter at Harbor City, Cal., is expected to return to his home soon.

Dr. Wm. H. Ivens (U.P. '10) of Philadelphia, has become a polo enthusiast and is constructing a large riding academy in the Quaker City.

Dr. Thomas E. Booth (N.Y.-Amer. '06), formerly of Peekskill, N. Y., is now located in New York City. He gives his address as 527 W. 160th St.

Dr. Wm. P. Shuler (Kan. '10), is enrolled as a Federal-Board-for-Vocational-Education student, for advanced work in Poultry Diseases, at the Iowa State College.

Dr. P. C. McLain (K.S.V.C. '18), of Gastonia, N. C., in remitting a check for his dues, writes, "I wouldn't be without the A.V.M.A. JOURNAL for anything."

Dr. Henry S. Weber (McK. '08) is now located in Lancaster, Pa., having recently removed from Weehawken, N. J., He gives his address as 27 East Liberty Street.

Lt. George W. Brower (K.C. '13), of the Officers' Reserve Corps, stationed at the Kansas State Agricultural College, recently underwent an operation for appendicitis.

The condition of Dr. Geo. W. Dunphy (Ont. '80) remains practically the same. Dr. Dunphy has now been confined to his bed almost continuously for nearly two years.

Dr. O. E. Dyson (Chi. '91), of the Packers and Stock Yards Control Bureau of the Department of Agriculture, has been transferred from St. Paul, Minn., to Kansas City, Kan.

Dr. E. T. Hallman (Ala.P.I. '10) of East Lansing, Mich., spent several days during April visiting and inspecting some of the state-owned herds for the Department of Agriculture.

Dr. L. A. Klein (U.P. '97), addressed the meeting of the Cumberland Valley Veterinary Club on April 5th, at Waynesboro, Pa., on the subject of "Parenchymatous and Catarrhal Mastitis."

Dr. George Kernohan (Kan. '12) is taking post-graduate work at the Pennsylvania State College, State College, Pa., and is majoring in Bacteriology on a problem in tuberculosis.

Dr. D. A. Piatt (Ont. '91-Chi. '98), of Birmingham, Ala., in remitting his dues, writes as follows, "I find many valuable things in the JOURNAL and do not feel that I can afford to miss a copy of it."

Dr. Norman J. Pyle (U.P. '18) is now connected with the Department of Veterinary Science and Animal Pathology, of the Massachusetts Agricultural College, at Amherst, as Research Professor of Avian Pathology.

Dr. O. C. Anderson (McK. '15) of Detroit, Mich., recently found it desirable to take the Pasteur treatment as a safety-first measure following a bite inflicted by a canine patient which subsequently proved to be rabid.

Dr. J. G. Rutherford (Ont. '79) is now at his farm in the Fraser Valley, in British Columbia, taking a complete rest, which is hoped to put him well on the road to recovery following his severe illness of the past winter.

Dr. W. J. Lentz (U.P. '04) addressed the regular meeting of the Western Pennsylvania Veterinary Club, which was held at Pittsburgh, on April 3rd, on the subject of "Anatomy of Birds and Diseases of Domesticated Fowl."

Dr. S. A. Goldberg (Corn. '14), of the Cornell University Faculty, gave an illustrated lecture before the staff of the Clifton Springs (N.Y.) Sanatorium, on "The Pathology of Deforming Arthritis," during the latter part of March.

Lt.-Col. N. S. Mayo (Chi. '89) and Major D. M. Campbell (K.C.V.C. '07) of Chicago, have been ordered to Headquarters of the Sixth Corps Area, for fifteen days special training, in connection with the Veterinary Officers Reserve Corps.

The friends of Dr. W. H. Ridge (U.P. '88), of Somerton, Pa., will be sorry to hear that he was unfortunate enough to fall and fracture his femur recently. He is resting as well as can be expected at the Hahnemann Hospital, in Philadelphia.

Dr. Guy S. Jones (Iowa '17), has removed from Rockwell City, Iowa, and is now located in Trenton, N. J., in care of the Y. M. C. A. In advising the editor of his change of address Dr. Jones wrote, "I do not wish to miss the JOURNAL."

Dr. E. S. Bacon (K.S.A.C. '20) has left Valley Center, Kan., to enter the Government Service as Veterinary Inspector in the Bureau of Animal Industry. Dr. Bacon has been assigned to Austin, Minn.. He gives his address as 907 W. Oakland.

Dr. Verne A. Scott (K.S.A.C. '18), who is a member of the staff of the John Tarleton Agricultural College, of Stephenville, Tex., in forwarding a check for his dues, writes as follows: "I hope the JOURNAL will continue to be of service to me in the future as it has in the past."

Dr. J. Raymond Wells (U.P. '22) has resigned as Dairy and Meat Inspector for the Department of Public Health, to accept a position with the Angell Memorial Animal Hospital, Boston, Mass. Dr. Wm. H. Haskell, (U.P. '12) has succeeded to the position made vacant by the resignation of Dr. Wells.

Among the veterinarians who have recently been examined at Manhattan, Kan., for commissions in the Veterinary Officers' Reserve Corps are: Drs. N. A. McCosh (Kan. '17), of Randolph, Kan; A. E. Schattenberg (Kan. '19), of Riley, Kan; and H. F. Lienhardt (U.P. '16), of the K.S.A.C. Veterinary Faculty.

Dr. U. G. Houck (U.P. '95) and H. R. Church (Ont. '92) addressed the Northwestern Pennsylvania Veterinary Club, on the subject of tuberculosis, at the regular meeting held in Scranton, Pa., on April 5th. Dr. Houck represented the Federal Bureau of Animal Industry, and Dr. Church represented the Pennsylvania Bureau of Animal Industry.

Capt. A. Eugene Hardy and Lieutenant Robert M. Blatchford (Mich. '22), are the officers of the Veterinary Company of the 107th Medical Regiment, which is now being organized in Detroit, Mich. The entire unit will be mounted, and besides the two commissioned officers in the company, will include five non-commissioned officers and 21 enlisted men.

Dr. Thomas E. LeClaire (Laval '90), of Calgary, Alta., who has been away from his office for the last two years, on account of poor health, has been spending the winter at San Diego, Cal. Dr. LeClaire is expected to return to Calgary about May 1st. He was much improved in health at last report. Dr. LeClaire is planning to attend the meeting in Montreal, which is his native city.

Dean V. A. Moore and Captain R. M. Buffington (Corn. '05), of Ithaca, N. Y., were in Washington during the first week of April, in consultation with Col. J. A. McKinnon, relative to the Veterinary Officers' Reserve Corps and the Veterinary Corps Training Unit. They also were in consultation with Major A. L. Mason (Corn. '05), at Carlisle, Pa., relative to the training camp for veterinary students during the coming summer.

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June, 1923

No. 3

IN ITS MAKING

In the April 1923 JOURNAL there appears an editorial headed "Publicity." Undoubtedly the author received his inspiration either from the absence of correct publicity or from the announcement that a commercial organization interested in the profession would launch an advertising campaign for the purpose of telling the truth. A most commendable editorial which speaks for the veterinary profession as a whole in broader terms than has ever before been approached.

The veterinary profession, professionally speaking, is young, and those who have liberally contributed toward its success are still in their prime and capable of accomplishing much more. The profession is now in its making; the foundation has been laid, the corner-stone has been sealed, and the frame-work has been erected, but the final arrangements which will contribute to its usefulness are now under construction. The masses casually view the skeleton frame-work and hear nothing of what it will ultimately mean. It is for us, the designers and builders, intelligently to inform the world what we are trying to do. We must not expect sensational advertising to do it all, but depend upon it as suggestive of what we can do; then let our achievements tell the truth.

Every veterinarian becomes a unit in the campaign about to be inaugurated and unless he measures up to the requirements, he alone will suffer, not the profession. It is either one or two things; help ourselves a little bit more, in conjunction with the advertising, or retrograde and deprive the profession a unit of assistance. The public is not holding the veterinarian from progression; conversely, it is offering immeasurable encouragement.

Certain members within the ranks are the enemies of the profession. The veterinarian who maintains headquarters around a filthy livery stable, or displays his sign over an old barn or shed with interior equipment to correspond, is an enemy to progression, sanitation and decency. This same veterinarian may have a slovenly appearance and be exceedingly adept in the use of vulgar and vile language. Yet all the advertising in the world, of what has been accomplished and what we hope to do, will never raise the foregoing class from the quagmire of disrespect and disgrace. Nevertheless, we have these factors to contend with and it is our duty to enter the missionary field and reduce the careless to an insignificant minority.

Every meeting of the A. V. M. A. should strive toward being an educational factor. The press is then at their service without cost, but see to it that accurate information is published consistent with the dignity of our ambitions.

E. I. S.

SPECIAL TRAIN FOR MONTREAL

Arrangements are being made for a special train, in connection with our convention, in Montreal, August 27-31. Dr. L. A. Merrillat, Editor of *Veterinary Medicine*, is the originator of this idea. We are lending every possible assistance, at this end of the line, to popularize this mode of travel to the Convention City. The plans for the special train are as yet incomplete, but it is quite likely that the train will leave Chicago over the Wabash Railway, at about 8:30 a. m., Saturday morning, August 25th. The train will reach Detroit during the afternoon and depart over the Canadian Pacific Railway, at about 4:30 p. m., for Kingston, arriving early Sunday morning. The party will leave the train at Kingston and travel by boat down the St. Lawrence to Montreal, arriving in the Convention City Sunday evening. This will enable them to spend Sunday night resting up, so as to be fresh to participate in the program beginning Monday morning.

We have been promised the certificate plan in connection with the railroad fares. This provides that if 250 travel by rail to the convention, and secure the proper certificates when the tickets *going* are purchased, these will entitle the holders to a one-half fare *returning*. We should have no difficulty in securing the requisite number of certificates, although it would be well for our members to keep in mind the difficulties which were encountered in this connection at St. Louis last year, through failure of so many members to secure their certificates when they purchased their tickets. Just as soon as plans for the special train are completed, announcement will be made in these pages. It is hoped that we will be able to make such announcement in the July issue.

EXECUTIVE BOARD ELECTIONS

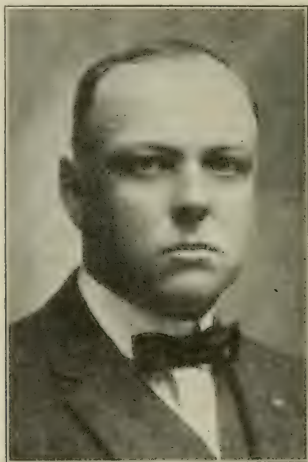
This is being written more than three weeks after the ballots were mailed for the election of members of the Executive Board for Districts 2 and 3. We cannot refrain from commenting upon the apparent lack of interest in this important part of our Association's activities. In District No. 2, over one-third of the members eligible to cast a ballot have failed to do so, while in District No. 3 more than one-half of the members eligible have failed to indicate their choice.

We have referred to the manner of electing our Executive Board as being the most democratic feature of the Association, but observations made on elections recently held in three out of the six districts lead us to doubt seriously whether mail-ballotting is entirely a success. We feel obliged to refer to this matter again, at this particular time, in view of the fact that there are members of the Association who are of the opinion that this feature of selecting officers by mail ballot should be extended, to include other officers. It is frequently stated that, in all large organizations, political or otherwise, it is frequently the organized minority which rules, and not the majority.

So far as the present elections are concerned, there can be no criticisms that the eleven candidates are not well known. Every one is a prominent veterinarian, both locally and nationally. There is sufficient range of choice to satisfy almost anybody, so far as the personal qualifications of the candidates are concerned. Among the eleven are seven practitioners, one state control official, one veterinary college professor, one laboratory man, and an editor; and yet almost six hundred members have, for some reason, failed to make a selection. What is the reason for this?

AN OUTSTANDING VETERINARIAN

Dr. W. A. Haines, of Bristol, Pa., who graduated from the Veterinary School of the University of Pennsylvania, in 1907, is now serving his third term as Bucks County Representative in the Pennsylvania Legislature, a distinction which has never before been bestowed in his County. He is chairman of the Agricultural Committee, a very important and responsible committee of the House of Representatives, and is a member of the following Committees: Appropriations, Public Health and Sanitation, Manufactures, and Game.



DR. W. A. HAINES

Immediately after he graduated, Dr. Haines began the practice of veterinary medicine in the Bristol community. Not only did he become successful in veterinary medicine but his success has carried him into many other fields. He operates one large dairy farm, is a vegetable and fruit grower and is interested in a large sand quarry.

Dr. Haines' opinion has considerable weight in most all problems pertaining to veterinary science and is well worth considering on most all matters relating to agriculture, live stock and educational questions in general. He was influential in the

organization of the Bucks County Farm Bureau and several other local organizations. He is president of the Veterinary Alumni Society of the University of Pennsylvania, is frequently asked to serve on committees of variable interests and is also a bank director.

Let more of us follow Dr. Hainés' example.

DEALER HELPS

No business man discounts the value of appearing to give something for nothing. It is frequently stated that we do not get anything for nothing, in this world, and that we pay for everything we get in one way or another. This is probably true. The term "dealer helps" is one which is frequently heard in commercial circles. Manufacturers of a great variety of articles assist their retail dealers in selling their products through the agency of these so-called "dealer helps." It is not strange that this modern method of merchandizing should have found its way into the veterinary field; it is in keeping with the times.

One prominent manufacturer of veterinary biological and pharmaceutical products is supplying veterinarians with cards, which they may circulate among their clients, offering to make post mortems on dead chickens, if the same are brought to the veterinarian's office or hospital. We are informed that the concern in question has received requests from veterinarians for over thirty thousand such cards. These briefly mention the common diseases of poultry and indicate that the veterinarian is prepared to vaccinate against or treat these conditions.

We are also informed that one state institution is doing something of the same kind, having also extended the idea to infectious abortion in swine. The swine breeder receives a card calling his attention to a few features of this disease and on the reverse side is a paragraph stating that the presentation of the card to his local veterinarian would entitle him to free office consultation and advice on abortion disease in swine. We believe that although this does savor of appearing to give something for nothing, that all parties concerned will profit in the end. We would like to hear what have been the actual results obtained by veterinarians who have taken advantage of this means of extending their practices.

YOU WILL BE DRAFTED

If you are of military age and physically fit, you are liable for military duty in case of national emergency. If you are not commissioned in the Officers Reserve Corps before November 11, 1923 (Armistice Day), you will be subject to draft for service in any capacity that the authorities think you are fitted for.

In case of national emergency, ALL officers not already on the active list, will be drawn from the Officers Reserve Corps. Officers will not be commissioned from civil life after the 11th of next November.

Veterinarians commissioned in the Officers Reserve Corps are assigned to definite units, so that in case of war they will know exactly where they are to go and what they are to do, thus avoiding the unfortunate confusion that occurred when we entered the World War. Veterinarians of training and ability are needed in the Veterinary Officers Reserve Corps. It is your duty as a patriotic citizen and as a veterinarian to place your services at the disposal of your country in time of war. Send to Col. J. A. McKinnon, Director of the Veterinary Corps, Surgeon General's Office, Washington, D. C., for full information and application blanks. If you do not do this before November 11th, and you are drafted as a private, the fault is yours.—*Do your duty and do it now.*

N. S. M.

NEW ENGLAND TUBERCULOSIS CONFERENCE

The fourth annual Bovine Tuberculosis Eradication Conference will be held in the State House, Concord, N. H., June 12-13, 1923. Two full days will be devoted to addresses, discussions and reports pertaining to the control and eradication of tuberculosis from cattle and its bearing on human health.

Speakers of national prominence, who will address the conference include: Dr. John R. Mohler, Chief of the Bureau of Animal Industry, and Dr. J. A. Kiernan, in charge of the Bovine Tuberculosis Eradication Division, Washington, D. C.; Professor H. R. Smith, Live Stock Commissioner, Chicago, Illinois; Hon. C. P. Norgord, Commissioner of Agriculture, Wisconsin; Hon. Andrew L. Felker, Commissioner of Agriculture, New Hampshire; Dr. F. Torrance, Veterinary Director General, Ottawa, Canada; Dr. E. C. Schroeder, Pathologist and Bac-

teriologist, Federal Experiment Station, Bethesda, Maryland; Dr. Wm. M. Stockwell, Superintendent of State Tuberculosis Sanitarium, Hartford, Conn.; Dr. Donnelly, President of the American Association of Certified Milk Commissioners, Brooklyn, New York; and many other eminent men.

EXAMINATIONS FOR ACCREDITED VETERINARIANS

Arrangements are being made to hold another examination, on June 25, 1923, for veterinarians who are not already on the accredited list and who are desirous of becoming accredited to do tuberculin testing. This examination will be held in several of the States and any veterinarian who is interested in taking it can learn all particulars as to the time and place of the examination in his State by addressing the State Veterinarian or the proper Live Stock Sanitary official of his State.

COMING VETERINARY MEETINGS

New York City, Veterinary Medical Association of. Academy of Medicine, 17 W. 43rd St., New York, N. Y. June 6, 1923.

Dr. C. G. Rohrer, Secretary, 40 W. 61st St., New York, N. Y.
Arkansas Veterinary Association. Marion Hotel, Little Rock, Ark. June 9, 1923. Dr. J. H. Bux, Secretary, Little Rock, Ark.

Texas, State Veterinary Medical Association of. Dallas, Texas. June 20-21, 1923. Dr. W. R. McCuiston, Secretary, 701 Wheat Bldg., Fort Worth, Texas.

California State Veterinary Medical Association, San Francisco, Cal. June 21-22-23, 1923. Dr. J. P. Bushong, Secretary, 908 Lindsay St., Los Angeles, Cal.

Michigan State Veterinary Medical Association. East Lansing, Mich. June 26-27-28, 1923. Dr. R. A. Runnells, Secretary. East Lansing, Mich.

Massachusetts Veterinary Association. Young's Hotel, Boston, Mass. June 27, 1923. Dr. C. H. Playdon, Secretary, Reading, Mass.

North Carolina State Veterinary Medical Association. Statesville, N. C. June 27-28, 1923. Dr. J. P. Spoon, Secretary, Burlington, N. C.

Oklahoma State Veterinary Medical Association. Medicine Park, Okla. July 9-10, 1923. Dr. L. B. Barber, Secretary, Live Stock Exchange Bldg., Oklahoma City, Okla.

- Illinois State Veterinary Medical Association and Fourth Annual Veterinary Conference. Urbana, Ill. July 10-11-12, 1923. Dr. L. A. Merrilat, Secretary, 4753 Grand Boulevard, Chicago, Ill.
- New Jersey, Veterinary Medical Association of. Hotel Marlborough, Asbury Park, N. J. July 12-13, 1923. Dr. P. B. Silvester, Secretary, Princeton, N. J.
- Virginia State Veterinary Medical Association. Ocean View, Va. July 12-13, 1923. Dr. Geo. C. Faville, Secretary, Hampton, Va.
- Minnesota State Veterinary Medical Association. University Farm, St. Paul, Minn. July 18-19, 1923. Dr. C. P. Fitch, Secretary, University Farm, St. Paul, Minn.
- Missouri Valley Veterinary Association. Omaha, Nebr. July 23-24-25, 1923. Dr. E. R. Steel, Secretary, Grundy Center, Iowa.
- Kentucky Veterinary Medical Association. Lebanon, Ky. July 25-26, 1923. Dr. J. A. Winkler, Secretary, Newport, Ky.
- New York State Veterinary Medical Society. Ithaca, N. Y. July 25-26-27, 1923. Dr. C. E. Hayden, Secretary, Ithaca, N. Y.

STATE BOARD EXAMINATIONS

- Arkansas State Board of Veterinary Examiners. Little Rock, Ark. June 6, 1923.
- Colorado State Board of Examiners. Capitol Bldg., Denver, Colo. June 8-9, 1923. Dr. A. N. Carroll, Secretary, Pueblo, Colo.
- Texas State Board of Veterinary Examiners. Dallas, Texas. June 18-19, 1923.
- California State Board of Examiners. San Francisco, Cal. June 20, 1923. Dr. John L. Tyler, Secretary, 120 E. Belgrave Ave., Huntington Park, Cal.
- Illinois State Board of Examiners. Senate Room, Capitol, Springfield, Ill. June 25-26, 1923.
- Massachusetts State Board of Examiners. State House, Boston, Mass. June 26-27, 1923. Dr. E. W. Babson, Secretary, Gloucester, Mass.
- New Jersey, State Board of Veterinary Medical Examiners of. State House, Trenton, N. J. June 29-30, 1923. Dr. J. Payne Lowe, President, 171 Jefferson St., Passaic, N. J.

THE MALE AS A SPREADER OF GENITAL INFECTIONS¹

By W. L. WILLIAMS, *Ithaca, N. Y.*

Mammalian existence is divisible into two distinct periods—pre- and post-natal. In each the health and life of the individual is constantly menaced by infection.

The study of disease has been almost wholly devoted to post-natal infections, of which vast numbers are recognized, and most of them are more or less effectively controlled. For all practical purposes, most veterinarians and breeders think of but one pre-natal infection for each species, which is termed *abortion* and its presence is indicated by the observed expulsion of a fetal cadaver. It has been undeniably shown, in recent years, that abortion accounts for but a minor portion of the losses from infections interfering with reproduction. The other infections of pre-natal life are commonly attributed to “sequelae” or “complications” of *contagious abortion*, although so far as known, the bacillus generally considered as the specific cause of abortion may not have been present at any time. By this expedient public attention is kept riveted upon *contagious abortion*, due to one specific bacillus, as the sole important cause of interferences with reproduction.

In human medicine two main venereal infections are recognized. Syphilis is regarded as a very important, the most important cause of any one infection, of abortion. Gonorrhea probably lowers the birth-rate as greatly as syphilis, but it acts with greater celerity and kills the ovum before or shortly after fertilization.

It is commonly stated by writers upon dourine that it causes abortion in mares, but writers upon equine abortion say that *the* cause is a bacterium, thus excluding the trypanosome. Whether dourine actually causes abortion in important numbers is unknown. In one of the largest outbreaks, the first in America, that in DeWitt County, Illinois, in 1886, which came under my official charge, no case of abortion could be definitely traced to it. Dourine acts too quickly and powerfully and destroys the ovum prior to the abortion period. There has been a mortal infection of the ovum but no fetal cadaver is seen expelled.

Aside from dourine, recognized venereal infections are not

¹Presented at the fifteenth annual Conference for Veterinarians at Cornell University, January 12, 1923.

commonly blamed with causing serious pre-natal disease. The genital pox or exanthem of equidae and bovidae are not commonly regarded as causing pre-natal infection, in the sense that they interfere with reproduction, but are thought merely to produce a brief disease of the copulatory organs. I am not aware that any data exist showing that females do, or do not conceive successfully by the same coitus which transmits the disease.

There is a general assumption by most people that the genital tracts, especially the deeper and more essential parts, are free from infection, although plenty of data are on record showing that the reverse is true. The thought that the uterus and other organs *should* be bacteria-free is apparently so irresistible that the ideal is accepted as proof and all evidence to the contrary ignored.

The study of pre-natal pathology was long deferred because there was upon the whole a surplus of young and it was necessary to limit reproduction by castration or sexual isolation. There was not, in earlier times, so marked a recognition of the difference in value between an excellent and a poor individual. This recognition of difference in values has become great. Now it is desired to breed only superior animals and in order to maintain adequate numbers it is essential that these produce the maximum of healthy young. Under these conditions pre-natal pathology has become of acute importance.

According to available data, it requires ten copulations for each four healthy young born in horses and cattle, with analogous results in swine. The failure of sixty per cent of the copulations to produce living young is referable to pre-natal death resulting from infection. If the infection kills or mortally injures the spermatozoa in the *tubuli seminiferi*, or elsewhere in the male genitalia, if the infection is added to the semen ejaculated and later kills the spermatozoa or the fertilized ovum, or if the infection exists in the ovary, oviduct or uterus of the female and kills ovum or spermatozoa, the principle remains the same; it is death from genital infection. So in cows, available data show pre-natal death of sixty per cent of all ova it is attempted to fertilize. If the same rate of mortality continued after birth, all calves would die before six months old. Viewed from this standpoint, the importance of pre-natal infection looms large.

The rate of mortality decreases as the age of the newly created individual increases. The most vulnerable separate mammalian life is the individual spermatozoon or ovum, while the newly

fertilized ovum apparently has but little greater resistance to bacteria. These early deaths do not interfere with the normal ovulation cycle.

The embryo early forms a buffer organ which is designated the placenta or afterbirth. This completely envelopes the young and affords wonderful protection but it is always imperfect. In all ruminants and swine there uniformly occur necrotic areas at the apices of the fetal membranes, due certainly to infection. In the equine fetus analogous conditions regularly occur in the chorion of the non-gravid horn. These pathologic changes in the fetal membranes advance as pregnancy progresses. If the fetus survives and is born, it discards the more or less extensively diseased organ and leaves it behind.

We marvel at times at the efficiency with which the living body casts off necrotic tissues. Here is a great organ, which has served a highly valuable function, over an important period of time, during which it has been attacked and become extensively diseased. Within this envelop and under its protection, new organs have been developed to take over its functions, and at an opportune moment the old diseased one is discarded, to be succeeded by the others which have been more substantially evolved. The new-born animal therefore begins post-natal life with as great freedom from infection as the placenta has been able to maintain. Thus a placenta may be so badly infected that it is "retained," although it may have protected the fetus well enough that it may be born slightly if at all infected and is vigorous and viable. Not always, however, is the placenta able to give ample protection to the fetus which survives to the normal end of pregnancy and is born. Often it is born so extensively infected that it falls seriously or mortally ill. If it survives it may carry the infection for an indefinite period in its post-natal life, thus constituting a link of continuity between pre- and post-natal infection. Recent investigations have shown that the essential genital organs of the male (testicles, epididymes, seminal vesicles, etc.) and of the female (ovaries, oviducts, uterus and cervix) quite commonly harbor infections which may at any time develop important pathogenic powers.

All genital infections producing definitely recognizable, specific lesions are freely interchangeable between the two sexes in coitus, such as dourine, the vesicular venereal disease, the venereal tumors of dogs, etc.

During pre-natal life the individual is menaced by infections from three sources. (1) The female genital tract regularly contains infections prior to copulation which may threaten the health or life of the new individual or of the male and female cells prior to union. (2) The male may ejaculate dangerous bacteria in his semen. (3) Infection may invade the pregnant uterus from the systemic blood of the female and thus reach the pre-natal individual.

Loyal disciples of the tradition that abortion is essentially, if not wholly, a result of bacterial invasion of the third class, firmly and intolerantly deny the importance of classes (1) and (2). Limiting their observations and theorizing entirely to the abortion bacillus, they have totally ignored class (1) upon the bacteriologic ground that at mating time they do not find this bacillus in the female genitalia. The literature does not indicate that the researches upon this point have been either extensive or accurate. At best the researches apply only to the abortion bacillus and leave untouched the far more comprehensive problem of pre-natal infection.

In the second group, which it is desired to discuss at this time, misleading effort was made by the adherents to the contagious abortion tradition with a view to cause veterinary practitioners and breeders to believe that the bull is not a source of danger and may be ignored as a carrier of genital infections. McFadyean and Stockman¹, Hadley² and others, used bulls which had copulated with cows which had sometime aborted, or the blood of which had reacted to the test for abortion infection, upon cows which were presumably healthy. The cows largely conceived and did not abort. It was not known that any one of the bulls discharged abortion bacilli in his semen or that he carried abortion bacilli mechanically upon his copulatory organs. Without using a bull which was known to be capable of discharging abortion bacilli from his genital tract, they reached very positive conclusions that the bull does not transmit infection by copulation. Even so, their experiments were limited to the abortion bacillus and had little if anything to do with the subject under discussion.

Certain factors may profoundly alter the comparative dangers of the transmission of genital infections by sexual contact. Prostitution leads to grossly excessive and promiscuous coitus which results in very intense genital infection, quite uniformly transmitted to man. In animal husbandry this condition is

essentially reversed and the male is subjected to excessive and often promiscuous coitus, so that he has an opportunity to acquire various infections and faces the inevitable danger that the existing infections shall become intensified.

It has been thoroughly demonstrated, especially by the medical department of the Army and Navy, that coital infection of the male may be obviated by post-coital disinfection. There is, however, no such safeguard available to the female through the medium of attention to the copulatory organs.

It is important to bear in mind that the male ejaculates the bacteria-contaminated semen directly into the female genital canal. In the mare the semen is partly ejaculated into the uterine cavity and this is possibly true to a lesser degree in other species. This difference has led to great confusion. Douching of the copulatory organs has been roundly condemned by many for its failure to control pre-natal infections. It should be clearly recognized that douching of the copulatory organs is of service in the control of infections which at the time are restricted to the copulatory area and just as clearly understood that douching can exert no influence whatever upon infections existing in the deeply-seated, essential, procreative glands and canals.

The question of the power of the male to transmit genital infections in copulation is fundamentally a problem for clinical determination. Hadley² ignores this truth and classes clinical observations as "circumstantial evidence," forgetting that the question of the transmissibility of diseases in general is necessarily decided upon clinical, not upon bacteriological or experimental evidence. Once the fact of contagiousness has been determined clinically, bacteriologic and experimental studies may be of very great value in clarifying diagnosis and methods of control. It has become an entirely too common and erroneous belief that a veterinary practitioner cannot determine by clinical observation that a disease is contagious and that this important question must be referred for decision to a bacteriologist.

W. W. Williams³, in cooperation with the writer, secured data upon the breeding efficiency of eleven bulls with over 150 cows which were bred to them. The herd was, as a whole, saturated with genital infections when the first complete examination of the females was made in January, 1917. At that time no attention was being paid to the genital infections of the bulls. As shown in Chart I, the first inventory of the herd revealed the fact that 51.5% of the females of breeding age were pregnant or

CHART I
REPRODUCTIVE EFFICIENCY AS INDICATED BY YEARLY INVENTORIES
OF BREEDING FEMALES

Date	Total Females	Pregnant or Pregnancy Terminated Within 3½ Months		Non-Pregnant Over 3½ Months	
2- 7-1917	103	53	51.5%	50	48.5%
9- 1-1918	84	53	63.0%	31	38.0%
10- 1-1919	66	45	68.2%	21	31.8%
10- 1-1920	75	57	76.0%	18	24.0%
7-15-1921	68	67	98.5%	1	1.5%

had been pregnant within 3½ months. Breeding operations were carried on with approximately equal energy throughout the year and there should have been at least as many females pregnant or recently calved on January 7, as upon any other day in the year. The cows being regularly placed upon official,

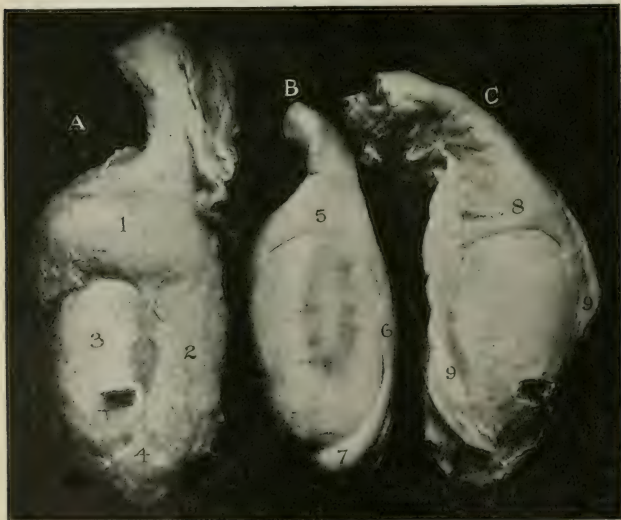


Figure 1. Diseased testicles and epididymides of bull P with a healthy left testicle (middle) for comparison.

A, diseased left testis; B, healthy left testis; C, diseased right testis.

1, globus major of left epididymis greatly enlarged and adherent to testis; 2, body of epididymis greatly enlarged; 3, testis; 4, tail of epididymis; 5, 6, 7, normal globus major, body and globus minor of epididymis respectively; 8, inflamed globus major of right testicle; 9, 9, adherent parietal scrotal peritoneum incised and turned back.

In A the parietal peritoneum has been removed by dissection.

yearly test they could not calve once each 365 days. Instead, the standard of computation adopted for this herd is 1 calf each 390 days. Upon this basis of computation there should have been ideally 73.1% pregnant or calved within $3\frac{1}{2}$ months, instead of 51.5%, or 21.6% below the standard set. But among these 53 pregnancies 20 (37.7%) aborted, so that only 33 calved within the period of 390 days. Instead of the ideal of 100 healthy calves there were 33. The records of examinations of the genital organs of females in 1917 and 1918 show that in 29 they were apparently healthy, while each of the others showed at one time



Figure 2. Vesiculæ seminales of bull P with normal vesicles on the left for comparison. Photographed from above and showing the anterior segment of pelvic urethra, seminal vesicles, ampullae of vasa deferentia, and urinary bladder.

1, 1, 1, 1, greatly enlarged, suppurating seminal vesicles (purulent spermato-vesiculitis) extending from the body of the prostate gland to the anterior end of the empty urinary bladder, 3.

In the healthy specimen on the left the normal seminal vesicles appear as two nodular swellings between the body of the prostate, 5, and the neck of the urinary bladder.

2, 2, enlarged terminal portions of the vasa deferentia; 3, urinary bladder; 4, pelvic urethra covered by Wilson's muscle and prostate gland; 5, body of prostate.

or another serious or incurable disease. The genital diseases gradually spread, and combined with tuberculosis had, within four years, caused the slaughter of all but two of the original females.

By handling the females alone some progress in reproductive efficiency was attained, but it was slow and the work was difficult and discouraging. After two years the improvement had been brought almost to a standstill. A number of very promising heifers which had been carefully grown were then ready to breed, and as an outcross the proprietor purchased by mail and imported a high priced sire. After he had served a number of heifers without a pregnancy, an examination revealed the fact that his testicles, epididymes and seminal vesicles were hopelessly infected and gross changes had occurred in these as shown in Figures 1 and 2. In his matings he ejaculated no semen because the glands contributing this fluid were all completely functionless. Infection in great abundance and of high virulence existed in his glands but thanks to the severity of the disease the infection was not ejaculated into the genital organs of the heifers and they were left unharmed.

This episode concentrated attention upon the other breeding bulls of the herd and resulted in the commencement of a highly interesting and instructive study of genital infections of bulls and of other breeding males.

Of the 6 bulls appearing in Chart II, A died and no postmortem was made, C was sold for breeding prior to the beginning of these studies, and bulls B, F, G and H were one after another slaughtered, as genital disease in each became manifest and careful examinations of the genital organs made. Bacterial growths were obtained from the genital glands of each and in three (the

CHART II
BREEDING RECORD OF SIX PRINCIPAL SIREs

Bull.....	A	B	C	F	G	H
Years used.....	1916-17	1916-18	1916-17	1918-19	1918-20	1917-19
Number of Cows Served.....	37	27	41	12	24	104
Average Copulations per Cow.....	1.67	1.56	1.24	2.0	1.5	1.8
Average Copulations per Conception.....	2.82	2.15	2.04	3.85	2.8	1.58
First Services.....	25	19	34	1	5	83
Previously Served by Other Bulls..	12	8	7	11	19	21
Conceptions.....	59.5%	74.0%	61.0%	50.0%	54.1%	63.4%
Abortions.....	22.7%	33.3%	16.0%	66.7%	23.1%	25.8%

fourth was not examined microscopically), histologic changes of definite importance were found.

The bacterial study in no case revealed the presence of the Bang bacillus and in no case failed to yield cultures of a streptococcus, of the viridans group, with frequent association of other organisms.

CHART III
BREEDING RECORD OF OLD BULL AND 5 YOUNG BULLS

Bull.....	G ¹	Q	R	S	T	U	Total 5 Young Bulls
Year.....	1920	1920-21	1920	1920-21	1920-21	1921	1920-21
Total Cows Served.....	21	27	9	20	12	3	71
Services per Cow.....	1.62	1.22	1	1.35	1	1	1.19
Services per Conception..	1.62	1.32	1.25	1.42	1.2	1.	1.35
First Service by This Bull	21	26	9	19	12	3	69
Served First by Another Bull.....	0	1	0	1	0	0	2
Conceptions.....	100%	93.6%	89%	80%	83.3%	100%	87.3%
Abortions.....	4.8%	0%	12.5%	6.25%	0%	0%	3.25%

¹Old bull used in herd also 1918-1919.

A study of Charts II and III shows that the breeding efficiency varied greatly among the bulls and that given the number of copulations per conception, the ratio of abortion may be foretold with relative accuracy.

Bulls B and F were condemned and slaughtered early upon their breeding records alone. Before bulls G and H were slaughtered the technic of clinical examination had been developed sufficiently that clinical diagnoses of genital disease were definite. At the same time a technical study of spermatozoa had been developed, so that the diagnosis of genital disease of bulls was based upon, in the living animal: (1) his breeding record, (2) physical examination of his genital organs, (3) examination of his semen, (a) volume and appearance, (b) numbers and motility of spermatozoa, (c) *detailed studies of stained spermatozoa*; and (post mortem) (4) bacterial cultures from the various genital organs, (5) histologic sections of the tissues. While a positive diagnosis might be safe when based upon one or two of these 5 data it is preferable, as in other diagnoses, to substantiate it by all available evidence.

Taking Bull H as typical of the group:

1. His rate of conceptions (63.4%) was low, and the ratio of abortions (25.8%) was high. The abortions all occurred in

cows, the genital organs of which had been carefully examined before breeding and appeared healthy. No one of the aborters had been previously bred to another bull during that breeding season. The cows bred to him during the later part of his career quite uniformly showed virulent vaginitis within a few weeks after copulation. Later examinations commonly revealed severe cervicitis.

2. Spermato-cystitis was later recognizable upon clinical examination.
3. Examination of the semen at first showed an abundance of motile spermatozoa. As the infection progressed, later examinations showed fewer spermatozoa with less motility and increasing aberrations in the cells, until finally the cells were few, motionless, and commonly the spermatozoon heads were without body or tail—dead spermatozoa—as shown in Figure 4, in comparison with healthy spermatozoa as shown in Figure 3.
4. Bacterial cultures from the seminal vesicles yielded *Streptococcus viridans* and *hemolyticus*.
5. Histologic sections of his genital organs showed:
 - (a) Desquamation of the germinal epithelium of the seminiferous tubules of his testicles, as shown in Figure 6, in comparison with a section of the healthy gland, as shown in Figure 5.
 - (b) The epididymal tubules, as shown in Figure 8, revealed no spermatozoa, as in the healthy tubule in Figure 7, and the epididymal mucosa in bull H has been wholly destroyed, while in the healthy animal it remains intact.
 - (c) The *vas deferens* of bull H shows complete desquamation of epithelium as shown in Figure 10, in contrast with the healthy duct in Figure 9.
 - (d) The seminal vesicles have largely lost their epithelium by desquamation and their cavities are filled with exudate and debris, as shown in Figure 12, in contrast with a normal vesicle shown in Figure 11.

There is thus forged an accurate chain of evidence in which no link is missing or contains an obvious flaw. His record as a breeder, the clinical examination of his genital organs, the study of his semen and post-mortem bacterial searches and microscopic sections of his organs uniformly testify to the presence of disease, and indicate clearly the impossibility of the escape of spermatozoa from the testicles without the danger of carrying



Figure 3. Healthy spermatozoa.

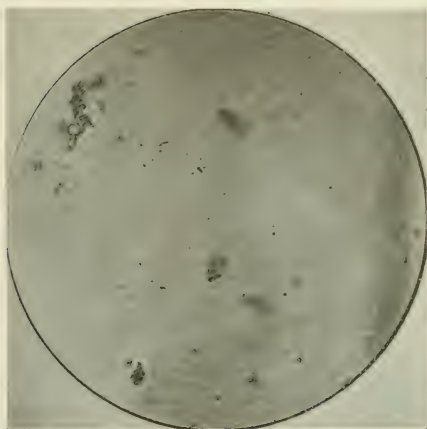


Figure 4. Abnormal spermatozoa collected from the vagina of cow after service with bull H.

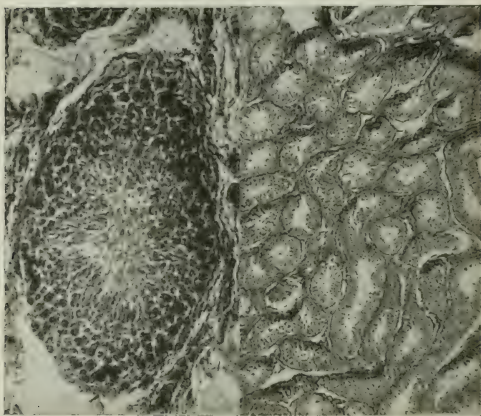


Figure 5. Normal seminiferous tubules under low (on the left), and high power (on the right).

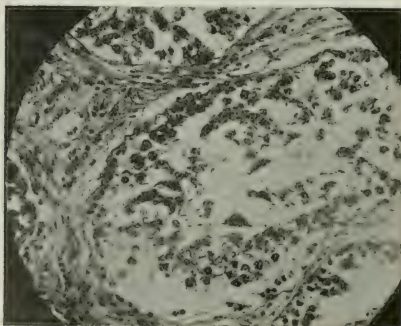


Figure 6. Seminiferous tubules from bull II showing desquamation of the germinal epithelium.

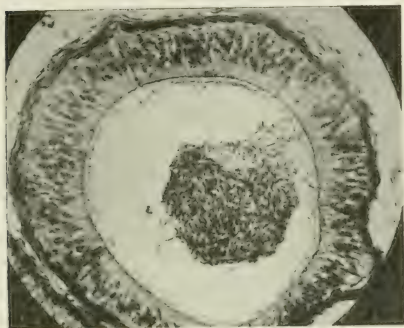


Figure 7. Normal epididymal tubule with ciliated columnar epithelium, its lumen filled with spermatozoa.

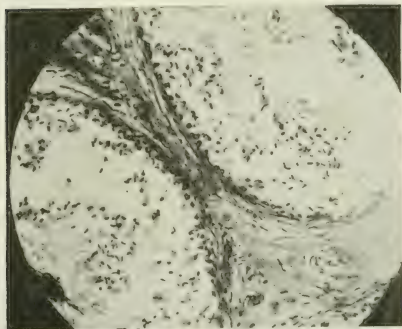


Figure 8. Epididymal tubules from bull II showing desquamation of the epithelium.

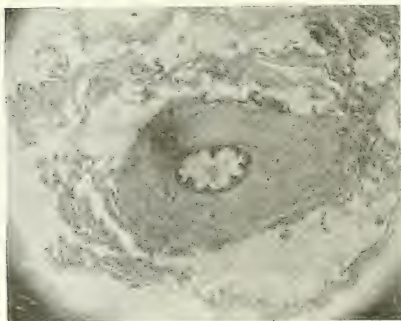


Figure 9. Cross section of normal vas deferens.

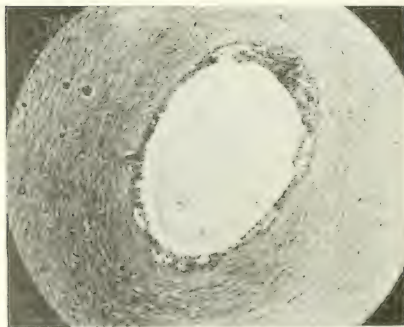


Figure 10. Cross section of vas deferens from bull II showing desquamation of its epithelium.

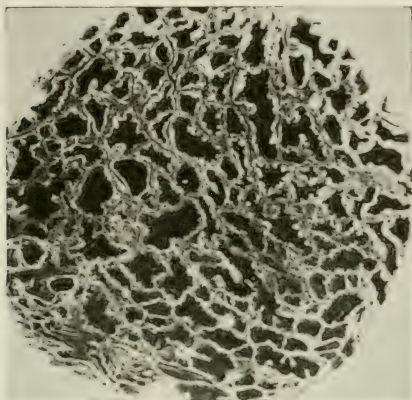


Figure 11. Section of normal seminal vesicle.

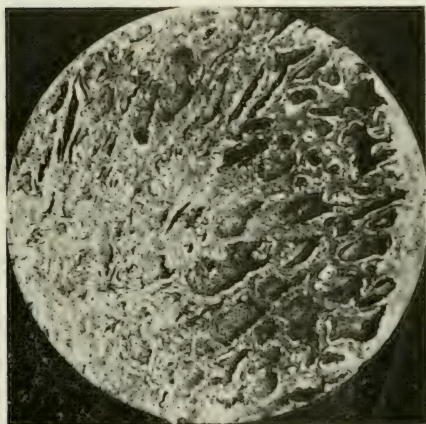


Figure 12. Section from diseased vesicle showing the lumen clogged with epithelial debris.

along bacteria, or of the fluid from the seminal vesicles being added to the semen at the moment of ejaculation without also adding bacteria. This proves irrefutably that bull H inevitably ejaculated bacteria in his semen. Logically an infection capable of causing such havoc in the genital organs of bull H should have a profound peril for the corresponding organs of the females into which the infection was thrown.

The females of this herd suffered in unusual proportions and intensity from cervicitis and salpingitis. The cervicitis largely yielded to treatment, but the salpingitis was beyond remedy and a large percentage of the original herd of females was ultimately destroyed on that account. Microscopic sections of the oviducts, as shown in Figure 14, indicated diseased changes analogous to those in Figure 7 from bull H, in sharp contrast to Figure 13, in which the normal oviduct is shown. Bacterial studies of the diseased oviducts yielded the same bacteria as those found in the genitalia of bull H.

It is impossible to understand how any reasonable person can doubt that bull H (and the other identically diseased bulls in the herd) inevitably and ruinously infected the females with which he copulated. It would be quite as unjustifiable to say that the females did not also infect the males and that the infection was freely and abundantly passed to-and-fro between the two sexes in copulation.

It has already been remarked that the exposure of the male to infection from the female, during coitus, is logically not so great as to the female from the male. Clinically that appears to be true. In this instance, however, there was a remarkably intense cervicitis, the cervical mucosa was much swollen, intensely congested, bright or dark scarlet and secreting a considerable volume of pus which kept the vagina constantly polluted. There was generally (except there had been surgical handling since last coitus) a definite collection of 0.5 to 1 cc of pus in the cervical canal. It was the most virulent and universal outbreak of genital infection that I have seen in a large herd. These considerations suggest with much force that, while some infections of the vagina, like the abortion bacillus of Bang, may have little danger for the male, there are infections of such intensity that it will be exchanged between the two sexes with as great fidelity as syphilis, gonorrhea or dourine and cause well-nigh as great havoc.

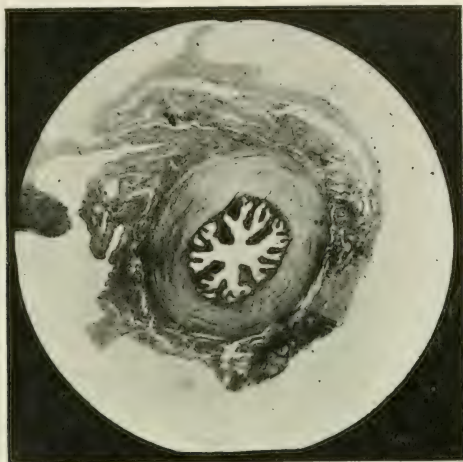


Figure 13. Cross section of healthy oviduct.



Figure 14. Cross section of diseased oviduct (chronic catarrhal endosalpingitis) showing lesions essentially the same as observed in the tubuli semiferi, epididymal tubules, vasa deferentia, and seminal vesicles of the bull. The bacterial culture obtained from each of the several structures have been essentially identical. From the same herd as bull H.

To complete the picture it will be necessary to study Chart IV, wherein is shown the contrast in breeding efficiency, after the original herd had been practically wiped out, and young stock grown carefully from the intensely infected parents, being sexually healthy, were mated. The number of breeding females

CHART IV
COMPARISON OF BREEDING EFFICIENCY OF HERD IN 1917 WITH 1921

	Total Cows and Heifers of Breeding Age	Pregnant or Calved within 3½ Months	Heifer Calves and Heifers under Breeding Age
1917	103	53	11
1921	68	67	32

has been reduced 33.6%, the number pregnant or calved within 3½ months advanced 26.4%, and the number of young females not yet in breeding increased 190.9%.

A single outbreak does not clearly establish the full meaning of the power of the male to transmit genital infections. Each herd and individual presents a separate picture and it is only by studying the subject from many points of view that the problem can be made to stand out clearly. The above herd was saturated through and through with a virulent infection at the commencement of the observations; there were no traces of any introduction of infection from without.

In a second herd the introduction from without was clearly traceable. A herd of purebred Holsteins had been breeding quite satisfactorily. It became desirable to introduce a junior sire for heifers and for some of the cows. A young bull, not previously used, was purchased and placed in service. His females immediately became diseased while those of the old bull continued to do well. They were all together in one paddock and barn and were cared for by the same attendants. Sterility was rampant in the females served by the new bull, but the genital organs of the cows which had not succumbed to acute metritis were apparently healthy. An examination of the young bull showed that he had an abscess of the left seminal vesicle, which had ruptured into the rectum (as shown in Figure 15). Chart V shows the results of the copulations by each of the two bulls.



Figure 15. Diseased seminal vesicles from Bull II in Chart V.

1, Pelvic urethra covered by prostate gland and Wilson's muscle; 2, body of prostate; 3, ampulla of right vas deferens pulled to the left by the abscess; 4, 4, right seminal vesicle, about normal in size; 5, 5, 5, large hard abscess of left seminal vesicle; 6, portion of interior of rectum, adherent to abscess and showing a fistulous opening in the incision through which the pus from the abscess escaped into the rectum; 7, urinary bladder, upper half cut away.

CHART V

BREEDING RECORDS OF HEALTHY AND DISEASED BULLS IN A PUREBRED HERD

Yr.	Bull	No. Cows	Copulations	Sterility		Abortion		Calves		Metritis ¹ %		Average Duration of Gestation days ²	Herd Increment (%) ³
				No.	%	No.	%	No.	%	Fatal	Re-cov'd		
1918	1	27	40	1	3.7	0	0	26	96.3	0	0	285.96	96.3
1919	1	20	22	2	10.0	0	0	18	90.0	0	0	285.06	90.0
1920		15	20	2	13.3	1	6.7	14	93.3	0	0	282.79	93.3
1919	2	13	19	1	7.8	3	23.1	9	69.2	23.1	15.5	278.44	46.16
1920		21	30	4	19.0	5	23.8	12	57.1	0	19.0	276.0	57.14
1921	1(a)	3	3	0	0	0	0	3 ⁴	100.	0	0		
1921	1(b)	15	22	5	33.3	1	6.7	9 ⁵	60	0	0		
1921	3(b)	6	7	6	100.0								
1921	4(b)	3	3	2	66.7	0	0	1	33.3				

¹Only marked clinical cases of metritis or retained fetal membranes included; ²abortions not included; ³herd increment=calves added by births less cows dead from genital infections; ⁴two had calved and one remained pregnant; ⁵pregnant at date of report, (a) not previously bred to No. 2; (b) previously bred to No. 2.

Such a picture is frequently seen in herds but there is also observed another very striking phenomenon. It sometimes occurs that a bull is used jointly for a year or two in two herds. In one the breeding is highly satisfactory while in the other abortion and sterility are rampant. This is regarded by many as destroying the force of the belief that in this case the young bull was the offender. But such cases do not detract from the conclusions logically drawn. This is borne out by studying Chart V for 1919-1920, and then comparatively for 1921 after bull 2 had been destroyed. There it is shown that females which had previously been bred to bull 1 only, continued to breed well but those which had been bred to bull 2 and later to bull 1 did very badly. The reason for this disparity seems clear. Bull 2 had lodged serious infection in the genitalia of his females which greatly lowered their breeding efficiency. Bull 1 did not contract, at least immediately, the infection from number 2's females, perhaps largely because the genitalia of the infected females had been carefully disinfected.

The fact that in two herds, jointly served by one bull, the females reproduce splendidly in one while in the other genital diseases are virulent and reproduction very poor, merely shows that the bull then in service is not disseminating infections. Such an observation indicates only that a healthy bull does not transmit genital disease. But the diseased herd of females may nevertheless have become infected by an earlier bull.

Another interesting group of data may be drawn from an extensive breeding stud. Several stallions were in service, some of the most heavily used being shown in Chart VI. There had been much abortion, but both mares and stallions had been given abortion bacterins. This group of animals constitutes a part of those reported upon by Koon and Kelsel¹, in which they enthusiastically claim to have controlled equine contagious abortion. They do not state just what they mean by contagious abortion, but Chart VI makes it perfectly obvious that, from the standpoint of reproductive efficiency, the stud remains absolutely bankrupt.

CHART VI
BREEDING OPERATIONS IN A STUD DURING 1920-1921.

Total Stallions Used	Total Mares in Stud	Total Breeding Years	Total Copulations	Number of Conceptions	Number of Copulations per Foal	Number of Foals	Number of Abortions	Percent of Foals per Annum	Percent Abortions	Percent Sterility
36	83	96	227	56	4.5	50	6	52.1	6.2	41.7
Record of 5 leading Stallions	No. 1	19	27	3	13.5	2	1	10.5	5.3	84.2
	No. 2	19	23	12	1.92	12	0	63.1	0	36.9
	No. 3	17	23	7	3.23	6	1	35.3	5.9	58.9
	No. 4	12	13	4	3.25	4	0	33.3	0	66.7
	No. 5	12	12	2	6	2	0	16.7	0	85.3
Mares served by No. 1 and later by other stallions		17	53	5	13.25	4	1	23.5	5.9	70.6

At the date of preparation of the chart it had required 4.5 copulations for each conception, but there were wide variations in stallions. No. 1 made 9.0 copulations per conception. Of his three pregnancies, one was aborted, one continued for 12 months and a pigmy foal was dropped and one healthy foal was produced. He thus produced one valuable foal with 27 copulations. It is to be remembered that the stallion and his mares had all been "cured" of contagious abortion by the use of bacterins, so that the low efficiency cannot be attributed to that complaint. It must be clear, however, that pre-natal death occurred, but at a date which did not result in the observed expulsion of a fetal cadaver.

The veterinarian in charge studied the breeding problem well and kept a close check upon the character of the semen. That of stallion No. 1 contained motile spermatozoa, though they were less numerous, and the movements less vigorous, than those of other stallions. When at the end of his career, as is the general rule with heavily-used, genitally-diseased males, the sperma-



Figure 16. Healthy spermatozoa from one of the fertile stallions in Chart VI.

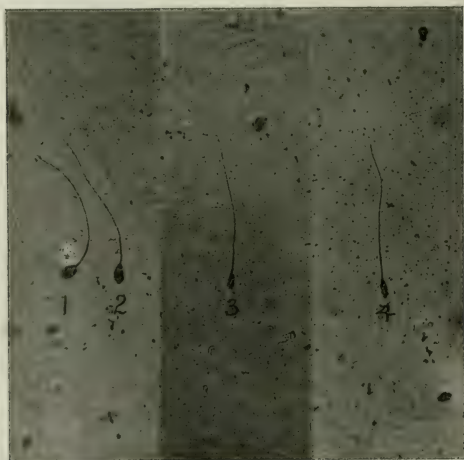


Figure 17. Diseased spermatozoa from Stallion 1 in Chart VI. Spermatozoa were so few that it required photographing three separate fields to get four spermatozoa. All are diseased and all parts take stains alike so there are no visible lines of division between the various parts, in contrast with the preceding figure of healthy cells.

tozoa became very few in numbers, non-motile, abnormal in size and form and the dead cells took the stain equally in all parts, as shown in Figure 17, in sharp contrast to the appearance of spermatozoa from a healthy stallion (Fig. 16) in the same stud. In order to get four spermatozoa into one picture, three fields had to be assembled. Up to the time of withdrawal from the stud he was therefore fertile upon the basis that he was ejaculating motile spermatozoa and he was free from contagious

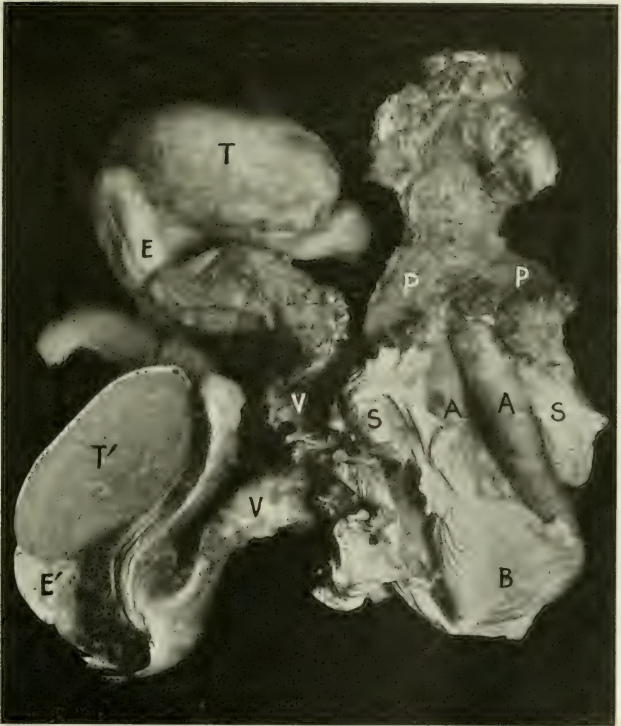


Figure 18. Genital tract from healthy stallion, seen from in front.

A, A, ampullae of vasa deferentia; B, urinary bladder; V, V, vasa deferentia; E, epididymis; E', section through epididymis; T, testicle; T', section through testicle; S, S, seminal vesicles; P, P, prostate glands.

abortion, according to the standards applied by Koon and Kelser.

A further study of the mares bred to No. 1, and later to other stallions having satisfactory breeding histories when mated with other mares, disclosed the fact that 13.25 copulations were required for each recognized pregnancy. These mares had been fertile before they had been bred to No. 1. The genital organs of these mares showed no noteworthy lesions but something had occurred rendering conception almost impossible. As with Bull No. 2 in Chart V, so here the evidence indicates that a highly infected male had transmitted in coitus an infection which not only killed the ova, which it was designed to fertilize, prior to the abortion stage, but had implanted a permanent infection in the female genitalia which barred impregnation by fertile males used subsequently.

Seventeen of the mares bred to No. 1 were later bred fifty-three times to fertile stallions and produced four foals. If the twenty-seven copulations made by No. 1, and the fifty-three copulations made by fertile stallions with the mares previously served by No. 1, are deducted from the total copulations, there was one foal born for each 3.3 copulations. So it is indicated that if the mares bred to fertile stallions be divided into two groups, analagous to two herds, the one group not previously bred to No. 1 required 3.3 copulations per foal and those previously served by No. 1 required 13.25 copulations per foal. Some would say, as has been often said, here are two herds served by one male, one of which reproduces well, and the other almost not at all, *hence the male does not transmit genital infections*. BUT THE OBSERVATION IS MADE UPON THE WRONG MALE. Upon physical examination No. 1 revealed extreme atrophy of the testicles with greatly enlarged seminal vesicles. He was destroyed some months later, after a long sexual rest, during which his seminal vesicles almost resumed their normal volume.

The post-mortem study of stallion 1 showed the extreme atrophy of the testicles which had been observed clinically. Figure 18 shows the genital tract of an apparently sound stallion and Figure 19 illustrates the diseased genital organs of stallion 1. Comparison of the two testicles, in section, brings out clearly the atrophy of the diseased gland. Most of the mass regarded clinically as the testicle proves to be epididymis instead. The tunic of the testicle of stallion 1 is greatly thickened

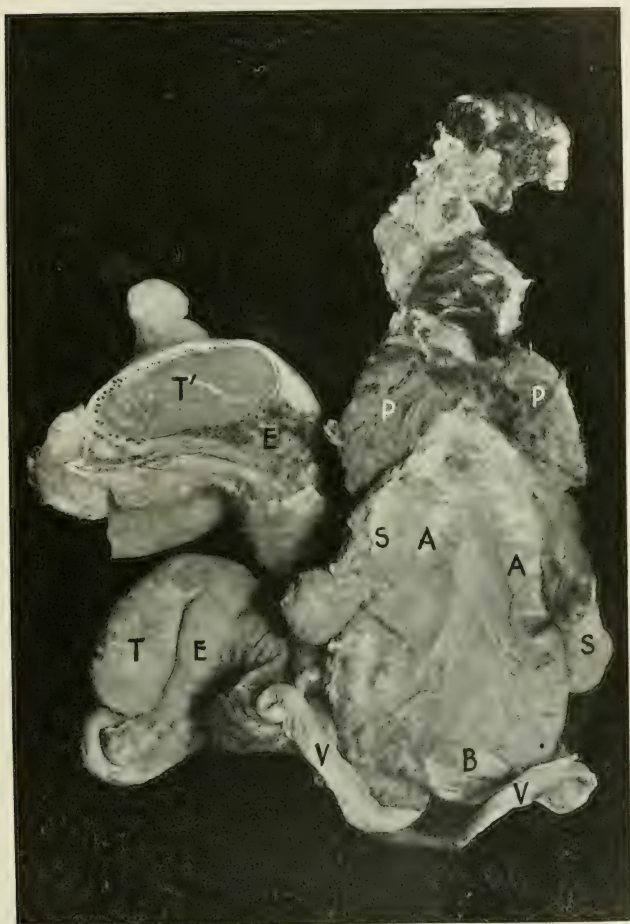


Figure 19. Genital organs from diseased stallion (No. 1 of Chart VI).

Lettering same as in Fig. 18. Note that the testicle, T, is rough on its surface, and in section T' that the gland is much smaller while its coverings are greatly thickened and show many large blood-vessels (black). The prostate glands, P, P, are enlarged.

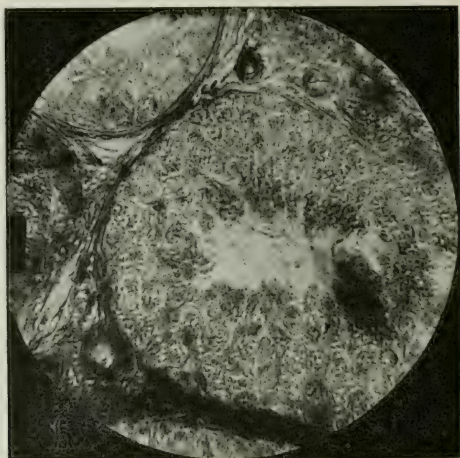


Figure 20. Healthy seminal tubules of stallion x 750.



Figure 21. Diseased seminal tubules from stallion 1, Chart VI, showing destruction of epithelium, x 750.

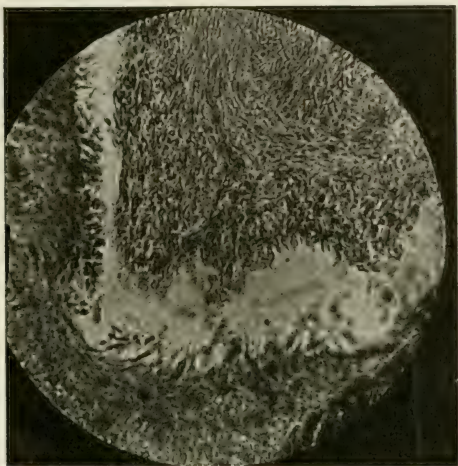


Figure 22. Healthy tube from epididymis, x 750.

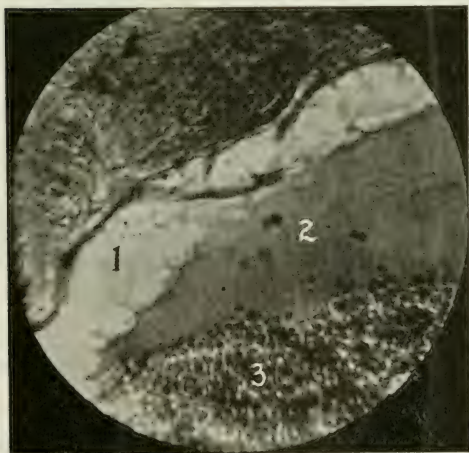


Figure 23. Diseased tube from epididymis of stallion 1, Chart VI.
1, Lumen of tube, with loss of epithelium; 2, lymph clot; 3, red blood-cells from hemorrhage into tube.

and shows numerous dilated blood vessels. The epididymis of stallion 1 is greatly enlarged and the coils of the tube are distended with blood.

Microscopic sections reveal that the seminiferous tubules (Figure 21), as compared with the healthy (Figure 20), have lost their epithelium by desquamation. The epididymal tubules, as shown in Figure 23, in comparison with the healthy in Figure 22, have lost their epithelium and extensive hemorrhages have occurred in their lumens. The *ampulla* of the *vas deferens* of stallion 1, as compared with the healthy in Figure 24, shows great enlargement of the diseased tube with a narrowing of the lumen. The glands of the ampullar walls are vastly enlarged and filled with firm masses, apparently disintegrated spermatozoa encased in mucus.

As in bull H, previously described, so in stallion 1, his breeding record, the clinical examination, the examination of his semen; and post-mortem, the microscopic sections of testicle, epididymis and ampulla are in perfect accord throughout, and forge about him an incriminating chain of irrefutable evidence.

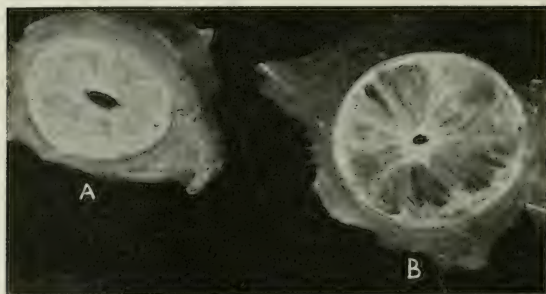


Figure 24. Cross sections of healthy and diseased ampullae.

A, healthy ampulla with uniform wall and large central canal; B, ampulla from stallion 1, Chart VI. It is greatly enlarged, its walls thickened and its lumen greatly diminished. The glandular structures are filled with hard masses, probably disintegrated spermatozoa bound together with mucus.

There was another stallion in this stud which is highly interesting, but was not included in the chart, because when it was made the results of his copulations were unknown. He had come into the stud recently and being a magnificent individual was

generously used. His genital organs appeared healthy in all respects. He ejaculated abundant, highly motile spermatozoa, but these presented an interesting and puzzling anomaly. Most of the cells had an elliptical enlargement located in the body or middle-piece, just behind the head (as shown in Figure 25). It was one-half as long and wide as the head. When the spermatozoa were fixed and stained the swellings largely disappeared, but remained clearly traceable in many. This defect is occasionally seen in equine spermatozoa but in this stallion it was the rule. I expressed the belief that the stallion was sterile and probably highly dangerous. None of his mares conceived. They were later bred to other stallions of known fertility, but none became pregnant. Here was a vigorous stallion, discharging plenty of semen, with abundant, highly motile, but anatomically imperfect spermatozoa. Yet he was infertile and highly infective.

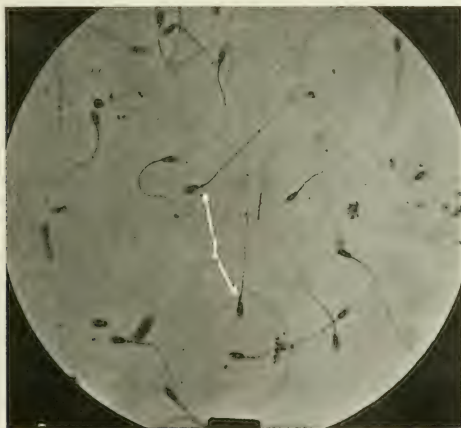


Figure 25. Diseased spermatozoa from an apparently healthy stallion. Note at 1 the peculiar enlargement in the bodies of the spermatozoa as described in the text.

It is very interesting also to consider that the anatomic fault was apparently a persistence of the characters of spermatids, and that the swollen portion was merely the protoplasm which is physiologically present shortly prior to the maturation of the spermatozoon. In other words, for some reason, the spermatozoa

had been shed prior to the completion of their development. Hence one might assume that for some reason other than infection, the ripening of spermatozoa was interrupted and premature discharge occurred. Were this so, then the injury would not go beyond non-fertilization by the male and the substitution of a fertile male would remedy the defect. Instead, the mares served by the diseased stallion were sterile when later bred to fertile males. Hence the inescapable conclusion is that the premature shedding of spermatozoa was due to an infection which was transmitted to the females in persistent form.

A study of Chart V shows that the duration of pregnancy in the females bred to bull 2 was about 7.5 days shorter than for bull 1; they were prematurely born. Some observing breeders regularly destroy prematurely-born, heifer calves because they usually fail to conceive, or becoming pregnant, abort. My observations indicate that it may be safely predicted that most prematures will prove sterile or will abort. Several colleagues who are active in the field of genital infections of cattle have made identical observations. It consequently appears from the comparatively limited observations available that prematurely born heifer calves are generally sterile or they abort. If this is true of heifers, the same must apply to prematurely-born bulls.

I have not yet obtained data upon the breeding efficiency of the progeny of bull 2 of Chart V, but it is reasonably certain that their showing will be bad. It is worth while, therefore, for the veterinary practitioner to study carefully not only the power of the male, with severe genital infections, to infect seriously the females with which he copulates, and the pre-natal young which he begets, but the more far-reaching problem of transmitting to his living progeny an enduring infection which will lower their fertility at breeding age. This problem has had little study. It is a common observation that a cow which conceives with difficulty, aborts, produces few calves, or raises heifers which prove poor breeders. The available data also indicate with much force that the bull with severe genital infection gets progeny of low fertility. This is well demonstrated in Chart VII, showing the breeding records of three prominent bulls in a large herd.

Bull 2, with 691 copulations, got 32% of calves, while bull 3, with 213 copulations, got 50% of calves. The fertility of bull 2 was 36% lower than that of bull 3. The 85 heifers of bull 2 produced 1.9 calves each and the 44 heifers of bull 3 produced

CHART VII
CHART OF THREE BULLS IN A LARGE HERD

Bull	Year	1911	1912	1913	1914	1915	1916	1917	1918	1919	1920	Total	Female Progeny	Calves Produced by Female Progeny
1	Copulations		4	21	48	77	45	16	2			213	32	41
	% Calves		50	48	40	34	22	19	0			33		
2	Copulations	8	39	82	117	73	106	106	86	64	10	691	85	163
	% Calves	100	33	34	32	27	39	27	26	28	90	32		
3	Copulations	23	70	61	37	35	6	0	3	2	1	213	44	162
	% Calves	83	54	33	41	40	0	0	33	0	0	50		

3.7 calves each, so that in the second generation bull 3, as a result of 213 copulations, had as many progeny as bull 2 with 691 (three times as many) copulations. Clearly, from the reproductive standpoint, bull 3 was by far the more valuable sire. Bull 1 did most poorly of the three, his 32 heifers producing but 1.3 calves each.

It is highly instructive to study the even decline of fertility in bull 1. If the fertility of the other two bulls is studied it will be seen that in these also there is a gradual but less regular decline from year to year. It is especially notable that the greatest drop in fertility occurs as a rule in the year succeeding the heaviest use. It appears to indicate that severe use of a male depresses his fertility and that it will show most definitely at some time subsequent to the strain. In one instance where a bull was very severely used he was totally sterile the next year.

Bulls which have been closely studied show first of all defective spermatozoa after fixing and staining, and the influence of frequent coitus upon the increased proportion of defective cells. If timely sexual rest is given the quality of the spermatozoa usually improves promptly. It is a not uncommon custom among breeders to crowd a bull (or boar or ram) very hard for one or two years and then discard him, partly because he has young females of breeding age and largely because the breeder believes (and he is usually right) that the young male is more "sure", and this is a part of the breeder's handiwork. A bull should be as fertile at 20 as at 2 years old, and will generally be so, if prudently handled. Some individual males have extraordinary sexual vigor, which means sexual health, and such animals have records of great numbers of progeny. Breeders have mistakenly concluded that any other male of the same species can duplicate the performance. The ability of a male to

copulate successfully a given number of times during a certain period, depends primarily upon his sexual health, and that varies greatly in individuals. Some arrive at breeding age already hopelessly sterile; others have low fertility with high infectiousness; others high fertility with low infection. If the highly fertile male is properly used, his fertility persists as long as the general health remains unimpaired.

The above data have been selected because of their illustrative value, from among abundant material occurring in domestic animals of all species. Identical experiences are had in sheep and swine.

The power of the male to transmit serious and destructive infections to the female and thence to her intra-uterine young, is an undeniable fact in all mammalian life. Veterinarians and breeders have as a mass failed to recognize this fact adequately and fully, and have, in line with well entrenched tradition, regarded the female as responsible for essentially all failures in reproduction. Technically they have admitted that somehow the male was necessary to reproduction and have kept sires for that purpose. In rare instances they have admitted that the male failed to cause conception but the infections in the female organs, could not, to their minds, be transmitted by the male. There is a bi-sexual standard; the male has male infections and the female suffers from "female complaints."

In the intense economic struggle of recent years it is desired to grow the maximum number of young from the best males and females of the species. In this struggle the superior male has taken an exalted place. Animal husbandry has, as one of its chief factors, polygamy and among the most vital problems is its prudent and efficient control. The problem has not been at all studied until very recently, and is now attracting the attention of a mere handful of observers; the great mass of veterinarians and breeders have their attention irremovably focussed upon a "female complaint" designated "contagious abortion" and they are unwilling or unable to assign to the male an important role in genital disease.

Recently an extraordinary effort has been put forth by highly influential organizations to exalt and intensify the innocence of the male in the transmittal of genital infections. At the head of these organizations is the United States Department of Agriculture through its Bureau of Animal Industry, ardently seconded by the American Veterinary Medical Association,

which represents the veterinary profession of the United States and Canada, and the United States Live Stock Sanitary Association which represents veterinary and lay officials engaged in the control of animal diseases in the United States.

Speaking officially for the United States Department of Agriculture, before the United States Live Stock Sanitary Association, Dr. E. C. Schroeder⁵ states:

"The discharges from the male sexual organs may be dangerous when the bull is permitted to run with the herd, and hence, in the control of bovine infectious abortion it is desirable that he should have a separate pen, away from the cows, and that he should be permitted to serve cows only on neutral ground, or ground to which cattle do not have access at other times than during that of service. It may also be wise to segregate cows after they have been served by possibly infected bulls until all danger that infected seminal fluid may leak from their vaginas has passed, and to fasten them during such segregation in a way that will prevent them from eating anything that may have become soiled with leakage from their vaginas

"The community or association bull evidently is harmless so far as infectious abortion is concerned, and he is so without elaborate and troublesome disinfection of his genital organs, provided the precautions already suggested, a bull pen, service on neutral ground, etc., are observed

"A search for other specific causes of abortions among cattle has not been neglected, and Bureau investigators could relate at great length stories similar to those other investigators have told about micro-organisms isolated from the products of abortions and the uteruses of cows that have aborted. Bacilli of various kinds, different types of micrococci and spirilla or vibrios repeatedly have been found, but when their pathogenicity has been tested in accordance with widely recognized and accepted and required bacteriological standards, not one shred of evidence has been obtained to prove them true etiological factors of bovine abortions."

It will be observed by the careful reader that in these citations Schroeder is not definitely concerned with the problem of genital infections and their influence upon reproduction, but wholly with "contagious abortion" and in the last paragraph cited he leaves the impression, without clearly so stating, that "contagious abortion" due to the abortion bacillus of Bang constitutes the sum total of all pre-natal or intra-uterine infections of consequence.

The Abortion Committee of the American Veterinary Medical Association for 1922, of which Schroeder was a member, incorporated the first paragraph above cited in its report, and this was adopted by the Association without opposition.

Dr. Schroeder's paper was promptly published, Jan. 6, 1922, and enthusiastically endorsed by Hoard's Dairyman, and a little later by various breeders' and dairy journals.

The attitude of the United States Department of Agriculture, as voiced by Schroeder, although wanting in precision, is highly dangerous and a serious peril to the breeding interests of the nation. The injury is not so directly due to what Schroeder

said as to what he omitted to state. The principle is well illustrated by the paper of Koon and Kelser¹, to which reference has been made. They claimed to have eradicated, controlled or otherwise placed *hors de combat* contagious abortion in the army remount stud, but as shown by Chart VI and Figures 16 to 25, while abortion was scarce, foals were rare and destructive genital infection rampant. One reading the contribution of Koon and Kelser would think their use of killed bacilli had accomplished great good, but the facts prove otherwise. Koon and Kelser did not say they had raised the breeding efficiency, but the average reader would think they so meant it. I am credibly informed that Koon and Kelser knew the facts recorded in Chart VI; at least the facts were available to them. The facts did not, in their judgment, form a part of contagious abortion and did not therefore have anything to do with their paper. This is, in brief, the general attitude: if bovine infectious abortion (due to the Bang bacillus) is present, it is of great importance, but if some other genital infection is present and causing indescribable injury to the breeder, that is of no interest and must not be mentioned. It is interesting to note that those who hold this view have not yet advised breeders how a herd of cattle would behave if contagious abortion were eradicated and they are left to assume that it would breed perfectly.

The facts above recorded are plain and unanswerable. Whether the destructive infections were or were not the Bang bacillus in the cows and the bacillus of equine contagious abortion in the mares is of no material concern to the breeders' bank account. The infections were perhaps not "contagious abortion" in either case, but they were highly destructive, ruining the herds, and, most important of all, they were undeniably transmitted by the male in copulation. If a rose were called a lily, the thorns would still prick.

When writers of great influence state certain things which may be correct, but omit other unchallengeable facts which have a vital bearing upon the problem under discussion, and thereby permit a highly perilous conclusion to be formed, they assume a great responsibility.

Hoard's Dairyman and other influential live stock publications hailed Schroeder's paper as freeing the breeder from the necessity for taking precautions in the handling of the male, which had to some appeared irksome and expensive. The breeder is led to believe that douching of the copulatory organs is unnecessary

or even injurious, that a genitally unsound male may be used with safety and with good results, that the guarding of the sexual health of the male and that the observance of the most common and obvious laws of sexual decency in animal breeding are useless if not injurious. With such teachings go great perils.

Chart VII shows well the evils of sexual excess and shows graphically what constituted sexual excess for those bulls.

Whether they were average bulls or not cannot be definitely stated, but until better data are at hand these should be thoughtfully considered. The United States Department of Agriculture (Farmers Bulletin 993) strongly advocates "community bulls", and many agricultural colleges have taken up the propaganda. The community bull goes into a number of herds and exchanges infections with each cow in each herd. The plea is made that by purchasing in a cooperative manner a high-class, pure-bred bull, he may be made to replace four or five grade bulls. That is precisely one of the elements which is lowering the reproductive efficiency of pure-bred animals—the attempt to have one male do the work of four or five.

One of the recommendations of this bulletin is that "only one satisfactory leap shall be permitted at each service; no bull shall serve more than two cows in one day, nor more than seven in a week, nor more than seventy-five in one year." This is a rate of service which, according to the data in Chart VII is imprudent and disastrous. The maximum of seventy-five cows in one year may mean 100 or (seven in one week) 365 copulations. Elsewhere it is stated, "If the bull is mature and vigorous and the breeding is carried on evenly throughout the year, the number of cows in a block may be nearly 100." Available data indicate that upon the average a bull makes 2.5 copulations per pregnancy. This would mean 250 copulations per annum, which would ruin probably four out of every five bulls, intensify the infections in their genital organs and spread destruction and ruin in his wake.

There is at present no good excuse for incurring these risks and producing such disasters. A bull may be purchased subject to such an examination of his genital organs and semen as above outlined and such examination, in competent hands, is reliable. The male which is not "sure", but still a breeder, is a menace, and deserves watching. The male in service may be watched and frequent examinations made so that any signs of danger may be heeded. Above all else the breeder should learn that the

male is no more capable of unlimited copulation than he is of consuming an unlimited amount of food or traveling an unlimited distance. The veterinarian and the breeder needs to learn the first and most important maxim in the production of abundant, healthy young: *Mate two sexually-healthy individuals.* The breeder needs as early as possible to free himself from the centuries-old tradition that females have genital infections or "female complaints" in which the male may not participate.

That the cooperative use of bulls may be of very great value is freely conceded; but its immense perils should be equally recognized. While it is possible, as contended by its advocates, that "bovine infectious abortion" may not be so spread, it is very certain that genital infections, perhaps having no direct relationship to contagious abortion, can be thus transmitted and bring ruin to the herd and its owner. If any one member of the block imprudently breeds a dangerous cow, all the herds in the entire block will be imperilled. It is better to think wisely before embarking upon "cooperative-bull" schemes than to think too sadly about them a few years later. The thoughtful student of genital infections, whether veterinary practitioner or breeder, has ample opportunity for making careful observations upon the sire as a spreader of sexual diseases and will frequently find evidence which indisputably proves that the male is a potent factor in ruinous diseases interfering with reproduction.

In the preparation of this contribution, I am under profound obligations for assistance by Drs. C. M. Carpenter, S. A. Goldberg and W. W. Williams.

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GENERAL FACTS TO BE CONSIDERED BEFORE THE ADMINISTRATION OF THERAPEUTICS*

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HISTORY OF THERAPEUTICS

The treatment of disease originated no doubt when primitive man cared for himself and his animals in case of sickness. Perhaps, instinctively, as in the case of some animals, he modified his diet when sick, sought rest and seclusion and in certain cases procured some unnatural substance for food. No doubt remedies were sought much in the same manner as were foods. That is, numerous things were tried for their effect upon some particular trouble. If good effects were obtained their use was continued; if disastrous effects were obtained, they were left alone.

The earliest authentic account of medicine is found in the scriptures. The writings of Moses contain many passages relative to it. It is said that the early Babylonians exposed their sick upon the highways and asked the passers-by if they knew of some remedy for the disease. In ancient Egypt the priests were among the first healers and kept their records of recipes for the cure of various diseases on tablets in the temples. As the treatment of disease became too extensive a subject to be handled by the same person who administered to the soul, the care of bodily sickness became a speciality, practiced by men who gave their entire time to it. In this manner arose our first physicians.

In the early days the practice of medicine was shrouded in mystery and religion. Drugs were used solely from reputation and recommendation. Little if any attention was given to their method of action. Usually a drug was employed because it was customary to use it in such a condition. Observations were inexact and were not controlled by scientific methods because the course of a disease could not well be prophesied. If a patient recovered, credit was given to the medicine; if he died from the effects of the medicine, the death could be laid to the severity of the disease.

The study of medicine up to our present time, has passed through a variety of changes until we have the following methods of treatment.

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Expectant: This means an absence of any real treatment beyond hygiene, rest, diet, etc. The object of this is to give nature full play. This method should always be practiced where no better treatment is known or when it is desired to let the disease progress for diagnostic purposes.

Symptomatic: This is aimed at the symptoms of a disease without reference to its cause. It may be indicated in some cases and contra-indicated in others. In striking at the symptoms one sometimes strikes at the disease. Again, the symptoms may be disagreeable or lead to such secondary results as to make their removal desirable. It must always be considered that in removing the symptoms we sometimes remove the only index to the disease or main disorder, as is the case of pain in colic. It is always necessary to be on the alert as we may sometimes think a disease is cured when really only some of the symptoms have been removed.

Empirical: This method consists in following the dictates of experience without regard to the reasons for the actions of the medicines. This method is necessary occasionally, but may result injuriously in many cases, because similar conditions may need different treatment.

Rational or Scientific: This method makes use of the three preceding, but has as its aim the removal of the cause of the disorder and to influence favorably the course of the disease. It depends upon pathology, physiology and pharmacology, and is often divided as follows:

1. Dietetic, including qualitative and quantitative changes in diet.
2. Physical and physico-chemical, including the application of heat, cold, massage and electricity.
3. Medicinal.

Rational therapy is the hardest of the practical subjects to master, and it is safe to say that the young veterinarian, even after a college course, is less prepared in the "stall" management and the office treatment of disease than in any other branch of veterinary medicine. At his school the hospital and dispensary cases were necessarily handled in a general routine manner. The patient was not individualized. In the hospital, the diet, bathing, electricity, massage, drugs and preparations were always given and used according to some one rule which can not well be varied in these institutions to suit an individual taste or need. Hence the graduate, and even the post-graduate,

unless he has especially studied therapy, starts his individual practice positively handicapped. He has no resources if his first dogmatic treatment has failed or was not suited to the patient.

All successful quackeries succeed because of their ability to relieve symptoms or to cause such mental suggestion as will relieve the overtaxed mind of the veterinarian or owner, and many a loyal client is driven to employ quackery by scientific neglect.

We have not sufficiently studied the various "pathies" and appropriated to our own use the small quantity of value which each may possess.

The old hobby of letting nature cure the patient has been ridden too long. Nature is a good mother but she will do just as much to propagate a pathological germ as she will to promote the welfare of the animal being infected by that germ. Consequently, neglect will not cure a patient.

The veterinarian must carefully study his patients, their symptoms and the result of his treatment and especially the results of medication. He must never confound his patient with the disease; it is the patient who has the disease that he is called upon to treat.

We hear of "natural-born" veterinarians, of intuitive sense and of great success in practice without much medical education and often without accurate diagnosis. This is true; a very scientific practitioner may fail on a clinical case, while a man with broad, keen intuitive sense will succeed. Common sense or horse sense, as it has been termed, is that ability to visualize all the knowledge applicable to the given case and then to note all the individualities of the patient and to modify the treatment accordingly.

Good therapy is an art. It requires high training, stored knowledge and good judgment to decide the proper hygiene, diet, exercise, rest, eliminative or antidotal treatment, and the physical measures, drugs, or surgery needed to cure a given patient. It is also just as important to know when not to use drugs that are contra-indicated in a certain disease; also after the diagnosis is made no two patients can be successfully treated in exactly the same way.

Unfortunately for the determination of what is rational and scientific therapy, we cannot dissociate ourselves from a deeply embedded belief in mystery in the treatment and cure of disease,

hence mankind, and the veterinarian is no exception, is impressed by cures by physical methods and by multiple or secret mixtures, when the cure is really brought about by nature or the resistance of the animal.

As just mentioned, we have not eliminated mystery from medical science, and still have a belief, unless we very carefully exclude it, in a multiple mixture, although it may not be a mythical mixture. We may know its contents. It is so easy to believe, when we are told that a drug in this particular combination has a particularly pleasant and efficient activity or that this particular kind of drug or preparation will not cause the disturbance that the well known and well tried basic drug causes.

We rarely need mixtures, whether Pharmacopeal, National Formulary, or Proprietary. Such mixtures may have value, but the active drug of the mixture can generally be given in a very simple manner and the results obtained be perfectly satisfactory, and the treatment be much more scientific.

A part of good therapy consists in the right use of the right preparation of the right drug. This object can be obtained only by a knowledge of the pharmacologic and toxic action of the best drugs, by a knowledge of their best preparations, and by a knowledge of how to administer them in proper doses. Consequently it is advisable that every practicing veterinarian should know the following, regarding every drug that he carries in his clinical case or prescribes in his every day practice:

1. The official English and Latin names and common synonyms, because the Latin name is used in prescription writing and the English names and synonyms are used in literature.

2. Source. This is important only in so far as some of the most widely used drugs are concerned.

3. Characteristics. Of only the most common and easily determined drugs. Form, color, taste, etc.

4. Composition of the inorganic, so far as the composition would influence its use or compatibility.

5. Active ingredients of organic preparations, alkaloids, glucosides, resins, etc. It is necessary to know upon what a drug depends for its action, as well as the source of some of the principles which are used alone. The composition is also important from the standpoint of compatibility.

6. Solubilities, so far as is concerned in the use of drugs.

7. Incompatibilities that are of importance in prescribing or using the drugs should be known.

8. Form in which drugs may be obtained and administered. Preparations and their strengths and doses, especially of the official and more commonly used unofficial preparations.

9. Physiologic and pharmacological action. Method by which the drug acts. Its action externally and locally, and upon the various systems of the body.

10. How it is absorbed and how eliminated.

11. Untoward and side actions. Whether there are any untoward or side actions must be looked after.

12. Uses or therapeutics. The uses can only be briefly pointed out in materia medica or pharmacology. The details should be worked out in the treatment of disease.

13. Contraindications. Conditions in which certain drugs are not indicated or in which they might do harm if given.

14. Administration. In what way, in what form and how often to use for different purposes.

We should also consider the factors which modify the action of drugs and these can be enumerated as follow:

1. Body Weight. It is obvious that it would be good practice to administer a definite dose according to the weight of the animal, as is done in pharmacological investigations, but it is not convenient to weigh animals in all cases and very difficult to estimate the exact weight. This method has been attempted. Take the weight of the horse at 1000 lbs. as 1, and estimate the dose for weights higher and lower than this. This has not proven very practical, and aside from varying the dose for large and small animals, is of little practical use.

2. Age. The age of animals is of considerable importance, but with the exception of a few drugs, which act more violently on young animals, is largely lost sight of, except as the dose is graded according to size. Weight is of more importance in veterinary dosage than age, because this varies so greatly in the different species handled.

3. Sex. In human practice women require less medicine than men, on account of their smaller size and greater susceptibility to any influences. In animals we do not see this difference, but irritant cathartics should be avoided during pregnancy on account of the liability to produce abortion.

4. Temperament—Race. High-strung animals are more susceptible than phlegmatic ones. This is particularly so in case of drugs acting upon the nervous system. The thoroughbred

or standard bred animals are much more susceptible than the draft type.

5. Tolerance—Habit. This is of little importance to veterinarians, as their patients are not addicted to drug habits, but we do occasionally find a horse which has been fed arsenic in sufficient amounts to become very tolerant to it.

8. Idiosyncrasy. This means an unusual reaction to a medicine or food. We occasionally find an animal in which ordinary doses of medicine will produce an unusual reaction or one in which extremely large doses are necessary to produce the usual reaction.

7. Species. On account of the structural and physiological variations in the different species of animals, the actions of drugs are not the same for all species. For instance, emetics do not usually produce emesis in horses, opium and its alkaloids cannot be depended upon to produce sedative action in the horse, and always produce excitement in the cat family. Dogs are very tolerant to morphine, but very susceptible to strychnine. Purgatives take much longer to act in herbivora than in carnivora or omnivora, etc.

8. Nature of disease. The nature of disease has considerable influence upon the action of drugs. For instance, the usual sedatives may have little effect in quieting the severe pain of enteritis, Antipyretics reduce temperature in fever, but not when it is normal. In some febrile conditions, especially influenza of horses, the usual purgative dose of aloes is liable to cause superpurgation.

9. Object of medication. This may be illustrated by several drugs. Quinine is given in much smaller doses as a bitter than as an antipyretic; ipecac and apomorphine in smaller doses as expectorants than as emetics; strychnine in larger doses as a stimulant than as a tonic.

10. In general liquids are more active than solids, and alcoholic liquids more so than aqueous. Active principles are more soluble than crude drugs, powders and dry filled capsules than pills, uncoated pills than coated ones, and tablet triturates than compressed tablets.

11. Channel of administration. It has usually been considered that the hypodermic dose is half the oral, and the rectal twice that of the oral. However, in a number of instances, drugs are absorbed as rapidly from the rectum as from the stomach. The rate of absorption of different drugs from various channels

differs so greatly that no absolute rule can be applied. In intravenous medication the dose is small, because the drugs are injected directly into the circulation.

12. Time of administration. This is not of any great importance in large animal practice, because the stomachs of herbivora are never empty. In carnivora the action is usually more rapid if given before a meal, because the medicine will not be diluted with the food in the stomach.

13. Frequency of administration. It is impossible to give any rule for repetition of doses. In general, drugs which produce action very rapidly require frequent doses to maintain their action, while those which act slowly are not often given more than two or three times daily. It is obvious that the dose of a potent drug is less if it is given at frequent intervals than at longer ones.

In order that we may better understand and check up just what a practitioner should know about a given drug before he prescribes it, I think a thorough discussion of one of the more common drugs would be desirable here. I have chosen for discussion the drug oil of turpentine, which I am sure is familiar to all of you. It is not my idea that I shall bring out anything new in this discussion, but it will give us an example to go by.

OLEUM TEREBINTHINAE

Synonyms. Oil of Turpentine, Spirit of Turpentine.

Source. It is obtained by distillation with water from the concrete oleoresin obtained from the *Pinus Miller* or from other species of *Pinus* (Fam. *Pinaceae*).

Characteristics. This drug occurs as a thin, colorless liquid having a characteristic odor and taste. It is a volatile oil and acts as a solvent for resins, fats, wax, gutta percha, India rubber, sulphur, phosphorus, iodine and many alkaloids.

Solubilities. It is soluble in three parts of alcohol and insoluble in water.

Incompatibilities. Water and other substances with which it is not miscible.

Form in which it may be obtained and administered. It may be obtained as the oil of turpentine or the Oleum Rectificatum. The latter is prepared by redistilling oil of turpentine over a solution of sodium hydroxide. Either drug should be administered as an emulsion, in oil, mucilage or in capsule.

Physiologic and pharmacological action. Externally, oil of turpentine is an irritant to the skin, causing itching, pain, redness or even vesication followed by a local anaesthesia. It produces intense irritability and restlessness when applied externally to some horses. The oil is but feebly antiseptic and as there are many other much more valuable antiseptics and disinfectants we would not recommend its use for this purpose unless from extreme necessity. As a parasiticide, the oil diluted two or three times with some bland oil may be painted on the skin to kill ring worm or lice.

It is principally employed externally as a stimulant and a counter-irritant. It is one of the main ingredients in many of the liniments used in veterinary practice. The following will serve as an example.

R

Pulveris saponis	℥ii
Olei terebinthinae	℥xxiv
Aquae ammonii fortioris	℥ii
Ammonii chloridi	℥iv
Aquae	q. s. Cong. i

Mix ammonia, soap and ammonium chloride in one-half gallon of water, shake, add turpentine and enough water to make one gallon.

The above preparation makes a creamy, white, stimulating liniment that will "stand up" if properly compounded. It will not blister unless confined under a bandage.

Turpentine is also valuable in various forms of inflammation, such as bronchitis, pleuritis, pneumonia, gastritis and enteritis, as it acts as a counter-irritant. It is probably of more service in the abdominal conditions and is best applied in the form of a turpentine stupe. To prepare a stupe of this kind we sprinkle freely, with the oil, a blanket or woolen cloth which has been previously wrung out of hot water. This is then applied to the abdomen or other part of the body, covered with some material to hold the heat and left on half an hour or longer according to the results desired.

Under certain conditions it is not always possible for the veterinarian to apply turpentine stupes, as the hot water, blankets, etc., are not available, and in this case the following prescription may be applied liberally to the patient's abdomen or chest as desired.

R

Ol. sinapis	℥ii
Ol. terebinthinae	℥ii
Aq. ammonii fort.	℥ii
Ol. gossypii sem.	℥ viii

M. Sig. Apply thoroughly once only to the abdomen of a horse suffering from enteritis. When a more severe counter-irritant or blistering is desired, the following combination of drugs will be found desirable. This combination forms one of the so-called "spavin cures" and should be applied once or twice daily with a brush until the area is blistered to the desired extent. To prevent permanent loss of hair the spot should be kept well greased with vaseline or some other like emollient, after the daily application of the blister has been discontinued.

R

Tincturae iodi	
Tincturae cantharidis	
Olei cajuputi	
Olei terebinthinae	aa ℥ii

M. Sig. Apply with a small brush as directed above.

A stronger, liquid blister, but one that does not make quite so nice a preparation, may be compounded as follows:

R

Hydrargyri chloridi corrosivi	
Camphorae	aa ℥ii
Olei terebinthinae	℥i

M. Sig. This may be applied for about three days with a small brush, omitted three days and repeated.

Internally oil of turpentine is of value as a carminative. It is very useful to relieve gastric tympany and flatulent colic in the horse and tympanites of the rumen in cattle. For this purpose it is usually combined with some preparation of ammonia and administered with linseed oil or in capsule. In these cases it causes the expulsion of the gas already formed and prevents fermentation, to which the condition is due.

R

Spiritus menthae piperitae	
Spiritus ammoniae aromatici	
Olei terebinthinae	aa ℥ii
Olei lini	Oi

M. Sig. Give at one dose, for a horse or cow with flatulence.

Enemata can also be employed for their stimulant action on the nervous system and circulation in collapse. One or two ounces of oil of turpentine are dissolved in two to four ounces of cottonseed oil, when used as an enema for horses.

In purpura hemorrhagica the use of turpentine is of long standing. Good results often follow its use in this disease although its action cannot be explained satisfactorily. It is recommended by some as a hemostatic for internal hemorrhages from the nose, lungs, digestive tract, kidneys, bladder, etc., but it is inferior to other agents for this action.

It is used as an anthelmintic especially for round worms in horses, dogs and swine. It is also used as an intratracheal injection for lung worms of calves and swine. It is usually given in oil for its action on the digestive tract.

As an antiseptic expectorant it is of value in cases of subacute or chronic bronchitis, with excessive purulent secretion, but is thought to be inferior to some other forms of terebene. It is often used for its local action upon the respiratory tract in various respiratory diseases. For this purpose it may be added to hot water and the animal allowed or compelled to inhale the vapor (steaming).

Oil of turpentine is indicated as a stimulant to the genito-urinary tract in cases of amenorrhea, chronic pyelitis and cystitis.

Old oil of turpentine is often advised as an antidote for phosphorus poisoning, because it contains ozone and forms a harmless camphor-like body—turpentine phosphoric acid. Its use has, however, been found worthless by some investigators.

Contraindications: Turpentine should not be administered when there is nephritis, congestion of the kidneys, or acute inflammation of the gastro-intestinal tract. Care also should be exercised in giving large doses of the oil to patients when there is present a constipation or stoppage of the bowels. Care should be taken in its purchase, when intended for internal use, as the commercial grade often contains impurities and poisonous substances which, when administered to an animal, will produce poisoning.

If one so desires, the odor may be disguised by the addition of almost any volatile aromatic oil and the color can be changed by suspending a piece of alkanet root in the stock bottle.

A SPORADIC OUTBREAK IN CATTLE RESEMBLING TETANUS

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INTRODUCTION

During the past two years, the writers have been called upon to investigate the cause of serious losses among Ayrshire cattle on a farm located in the eastern part of the Province of Quebec. As far as could be ascertained, losses began in the year of 1918, and still continue. Among the early losses, there were seven adult animals and a number of calves. Lately, only animals under the age of three years have died, with a mortality as high as ninety-five (95) per cent. Once the symptoms appear, age has little to do with the prognosis of the case. Of the animals which have shown symptoms, only two have survived.

Records of the herd show that, in 1921, twelve animals were lost, and in 1922, sixteen. Previous years have shown about the same rate of mortality. The initial loss from the outbreak has been estimated at approximately \$15,000. The potential losses would be even much greater, since the animals were pure-bred and free from tuberculosis.

The disease has persisted and has been confused with other diseases of a contagious and infectious nature. Clinical symptoms have indicated forage, arsenic and strychnine poisoning, blackleg, anthrax, tetanus, hemorrhagic septicemia, and "vibrion septique." Early in the outbreak, chemical and bacteriological examinations did not assist in determining the causative agent.

CLINICAL SYMPTOMS

The onset of the disease in cattle is very insidious. No symptoms in acute cases are noticeable to the herdsman until about half an hour before death takes place. A typical picture is as follows:—Bleating, wild running about the stall, running into objects, circling always in the same direction, and eventually falling to the floor. The ears are erect, eyes (pupils) dilated, tongue protruded to one side of the mouth, slobbering, rapid, forced, or labored respiration. When down, the animal is unable to arise and the slightest noise excites convulsions. The head is drawn backward, the back arched, legs extended and twitching,

and can not be changed upon pressure. Increased convulsions are excited by rubbing the hair or by offering food. The animals are apparently blind.

The pulse is rapid, weak and almost imperceptible. The mucosae are congested and the extremities are cold. On auscultation the heart is found to be irregular, and the beat can be heard easily over any part of the thoracic cavity.

Respiration is dyspneic, shallow and very painful. A frothy, bloody, nasal discharge is observed in some cases.

In all cases a characteristic chain of symptoms is seen in the digestive system, namely:—Anorexia, cessation of the peristalsis, tucked-up appearance of the abdomen, diarrhea, and the drooling of a thick, viscid, stringy saliva. In the early stages there is a constant champing of the jaws, which gives the animal the appearance of yawning. As the disease progresses the jaws become set. The temperature remains normal throughout the condition.



Fig. 1. Shows progressive clinical symptoms exhibited by cattle infected with the disease produced by this organism. Note elevation of head, ears erect, wild look, hair coat, as observed in early stages of the disease.

Animals die in the position assumed before death. Death under these conditions indicates a comatose condition. Animals sick for a very short time show greatly increased nervous reflexes. Where recovery follows, the animals show a chronic debilitated condition, atrophy of the muscles, and nervous disturbances not unlike chorea.

GROSS PATHOLOGY

Carcasses do not exhibit any peculiar external or characteristic conditions. A frothy, bloody, nasal discharge, a drooling of a thick, viscid, stringy saliva, and a bloody diarrhea are often observed.

In the abdominal cavity, a sero-hemorrhagic exudate is found, together with certain changes in the parenchyma. There is a sloughing of the mucous membrane of the small intestine, a hemorrhagic and degenerative condition of the liver, spleen and kidneys. The bladder is distended. Submucous, subserous and subcutaneous hemorrhages are seen.

The thoracic cavity also contains a sero-hemorrhagic exudate. The lungs show varying stages of inflammation from congestion to consolidation. The heart exhibits a marked degeneration of the myocardium and is devoid of blood.

The brain and meninges are congested and surrounded by an exudate of a sero-hemorrhagic nature.

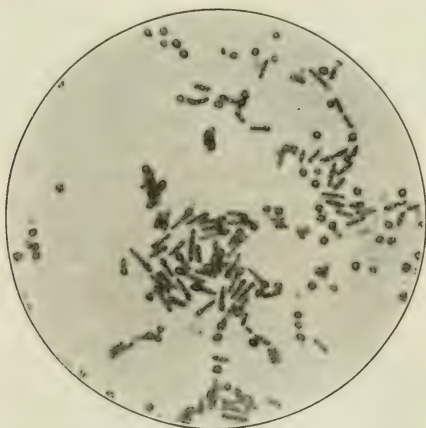


Fig. 2. *B. subtilis* from agar culture, 24 hours at 37°C. Stained by Gram. $\times 1200$.

ISOLATION OF THE ORGANISM

An organism showing the characters hereafter described, and provisionally named *Bacillus subtilis* (because of the fact that it is commonly found in cork), has been isolated from wounds made by a punch, used in ear-tagging; from navels; and from the inter-

nal organs of calves dead with the disease. It has also been isolated from cork-brick stable-flooring, unused cork-brick, granulated cork used in the manufacture of the cork-brick, cork dust used in the packing of grapes, insulating cork, and from soil of the farm.

DESCRIPTION OF *BACILLUS SUBERIS*

In 24-hour cultures at 37°C, inoculated from the diseased animal tissue, diplococcus forms are found, 48-hour broth cultures show bipolar forms when stained with methylene blue, 72-hour cultures exhibit the presence of bacilli with terminal spores resembling tetanus. Sub-cultures on agar show spore formation and bipolar forms in 24 to 36 hours. The bacilli have rounded ends and seldom unite in pairs or chains. In 12- to 18-hour, broth cultures the bipolar forms appear, but were observed best in milk cultures 5 to 7 day old at 37°C. With methylene blue the organism does not stain deeply but at one or both poles and sometimes in the centre of each rod metachromatic granules are found which take a reddish or purplish tint. Jordan and Harris¹, in a paper on Milk Sickness, report an organism with similar reddish granules. 24- to 36-hour agar slopes at 37°C show vegetative cells from 0.5 μ to 1.0 μ in width and average 4.5 μ in length. The organism is motile with peritrichous flagella, Gram-negative, aerobic and facultative anaerobic.

CULTURAL CHARACTERISTICS

- B. P. agar slope at 37°C. Growth in 24 hours is rapid, spreading, glistening, of a dirty grey color.
- B. P. agar plate at 37°C. (a) Surface colonies in 24 hours are spreading, irregular, smooth, flat, contoured and greyish to white in color.
- (b) Surface colonies of a second type are circular to ameboid, smooth, slightly raised, greyish white. Colonies in 24 hours are 2-3 mm. in diameter.
- (c) Under low power the second type is entire, irregular, dark-centered, coarsely granular and greyish to white in color.
- (d) Submerged colonies are ameboid, floccose, greyish to white in color, and up to 1 mm. in diameter.
- B. P. broth at 37°C. In 24 hours, clouding, no pellicle, heavy precipitate; clearing in 72 hours.
- B. P. gelatin stick at 20°C. Faint, filiform growth on deep line of puncture. Distinct cup or funnel liquefaction in 4 days.
- B. P. gelatin plate at 20°C. Glistening, entire, waxy, surface colonies, of 0.5 to 1 mm. in diameter, appear after 72 hours. Submerged colonies are smaller, and about 0.5 mm. in diameter, yellowish and yeast-like in growth. Under low power these are entire, conglomerate, finely granular and yellowish in color. In 6 days the liquefaction of surface colonies is cup-shaped, with a distinct centre and a concentric ring. Average size, 4 to 5 mm.
- Dunham's solution at 37°C. Heavy pellicle, medium clear, pellicle falls with slight disturbance and reforms.
- Dunham's solution, at 37°C, with the addition of 1% of saccharose, lactose, maltose, dextrose and mannite and 1% of Andrade's indicator, is negative for acid and gas in 48 hours.



Fig. 3. Rabbit inoculated with the organism isolated from calf. Photo one hour before death. Note characteristic position assumed, ears erect, limbs extended, hair coat slightly ruffled.



Fig. 4. Rabbit inoculated with organism isolated from granulated cork. Photo twelve hours after death. Note symptoms as shown in Fig. 3.



Fig. 5. Rabbit inoculated with the organism isolated from cork-brick. Photo one-half hour before death. Note the symptoms previously mentioned.

Dunham's solution at 37°C gives positive indol with the Ehrlich test in 72 hours.

Plain milk at 37°C. In 6 days partial coagulation; in 7 days partial coagulation and digestion.

Litmus milk at 37°C. In 6 days partial coagulation and reduction of litmus; in 8 days reduction almost complete, with partial digestion and coagulation.

Nitrate broth at 37°C. Slight clouding in 72 hours, with no change to nitrites. Cohn's solution at 37°C. No change in 72 hours.

Potato at 37°C. Moderate, raised, spreading, dirty yellowish growth in 24 hours.

AGGLUTINATION TESTS

Agglutination tests of the serum of a recovered heifer gave a positive test in dilutions up to 1 : 320. In the case of an adult bull which recovered some three years ago, a positive test was furnished in dilutions up to 1 : 80. Preliminary tests indicate the presence of agglutinins in the blood of recovered animals.

EXPERIMENT ANIMALS

Experiment rabbits, dogs, cats and guinea pigs inoculated with the organism previously described, exhibit the typical symptoms observed in cattle. Autopsy findings were identical with those of cattle dead with the disease. The organism has been recovered from the body tissues, and the site of inoculation in all experimental autopsies. Reinoculation with *B. suberis* isolated from experiment animals also proved pathogenic.

Figures 3, 4 and 5 show typical symptoms exhibited in experiment rabbits, by inoculations with 48-hour cultures of the organism.

HISTO-PATHOLOGY

The conditions are as follows:—

1. Acute hemorrhagic and degenerative meningitis.
2. Acute sero-hemorrhagic and degenerative myocarditis.
3. Acute sero-hemorrhagic and degenerative hepatitis.
4. Acute hemorrhagic and degenerative splenitis.
5. Acute sero-hemorrhagic and degenerative nephritis.
6. Acute hemorrhagic and diphtheritic enteritis.
7. Local lesion, when located, exhibits a purulent and necrotic condition, with a proliferation of tissue.

DIFFERENTIAL DIAGNOSIS

The disease has been confused with and diagnosed by local veterinarians as tetanus, forage poisoning, metallic poisoning, blackleg, anthrax, hemorrhagic septicemia, and "vibron septic." In addition to the above-named diseases there appears to be a similarity between this disease and milk sickness.

While the ante- and post-mortem symptoms may be similar, in some respects, to each of the above diseases, differentiation is possible. The following means of differentiation may be used:—temperature, blindness, lack of crepitating and emphysematous areas over the local lesion, a study of the parenchyma by histopathological means and by bacteriological examinations.

PATHOGENICITY

The organism is pathogenic for cattle, pigs, rabbits, dogs, cats and guinea pigs. On the farm where the disease existed, two animals are known to have recovered. With experiment rabbits, clinical symptoms are always apparent with inoculation experiments, but in some cases death did not result.

REVIEW OF THE LITERATURE

In an exhaustive review of the literature, the authors have failed to find any organism described which conforms in detail to the one under study. Whilst somewhat similar organisms are recorded in the literature, minor differences in morphology and cultural characteristics separate this organism from those described.

Organisms showing the greatest similarity are *B. tetani* and the pseudo-tetanus group. Our organism differs, however, from *B. tetani* in staining properties, cultural characteristics and oxygen requirements¹. The pseudo-tetanus forms described by Bain², Neide³, Bienstock⁴, Wright⁵, Flügge⁶ and others, are for the most part non-pathogenic, and their morphological and cultural characteristics differ from those of our microbe.

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SYNTHETIC MILK PERHAPS

A little girl from the city had been visiting in the country, and was being questioned as to what kind of time she had. Finally some one said, "I bet you don't even know how to milk a cow."

"Bet I do," she said.

She was pressed for particulars, and explained, "You take the cow into the barn and give her some breakfast food and water and then you drain her crankcase."—*Prairie Farmer*.

FAT NECROSIS IN COWS AND ITS RELATION TO THE DIAGNOSIS AND TREATMENT OF STERILITY¹

By DR. C. J. MARSHALL, *School of Veterinary Medicine,
University of Pennsylvania.*

During the past two years of Ambulatory Clinic work in herds near Philadelphia, fat necrosis has been diagnosed in five dairy cows. It is not the purpose of this paper to discuss the pathology of fat necrosis, lipoma, obesity, etc. Those who are interested in this part of the subject are referred to an article by Dr. W. A. Hagan, which appeared in the *Journal of the American Veterinary Medical Association*, September 1921, and to standard text-books on pathology.

Judging from experience, conversation, and correspondence with veterinarians who are engaged in Federal Meat Inspection and those who are working with breeding problems in dairy herds, fat necrosis has been recognized in general practice but a short time, yet a number of interesting cases have been encountered. Men engaged in Federal Meat Inspection say that it is not rare in cattle slaughtered for beef. It appears most common in animals that have received good care and are in prime physical condition.

In discussing the causes of fat necrosis, Wells states that practically all cases are produced by the action of the pancreatic juice upon fat tissue, presumably through the action of enzymes it contains, and that the condition can be produced experimentally by any procedure that causes the escape of the pancreatic juice from its natural channels. He further states that in human pathology it has followed trauma and acute infection of the gland and the blocking of the ampulla of Vater by gall-stones, which permits the bile to back up into the pancreatic duct, where it produces an acute inflammation of the pancreas. His experiments showed that lesions of fat necrosis may be produced in three to five hours large enough to be visible to the naked eye. Healing follows rapidly in cases of recovery; the foci may disappear as early as eleven days after their formation. The condition is said to occur most often in dogs and hogs. It has been seen in sheep and horses.

Necrotic fat appears much like suet, hard, irregular in shape

¹Presented at the fortieth annual meeting of the Pennsylvania State Veterinary Medical Association, held at Harrisburg, Pa., Jan. 23 and 24, 1923.

and varying in size. In a case that came under our observation, one mass weighed thirty pounds. When palpated through the rectum small lumps feel somewhat like a firm ovary, a tuberculous mesenteric gland, or a cotyledon. In most cases necrotic masses of fat are located only in the abdominal cavity and principally in the mesentery.

Hagan reports that in one case examined by him a fatty mass had surrounded a loop of bowel and stopped peristaltic action. In one of our cases a similar condition was present.

Fat necrosis might easily be confused with tuberculosis by rectal palpation, or even at autopsy. We felt justified in eliminating tuberculosis for the reason that our cases all appeared in officially accredited herds.

Our first experience with fat necrosis occurred January 5, 1921. The subject was a purebred Ayrshire cow, seven years old and in good physical condition. The herd-book history showed that this animal had dropped healthy calves January 1917, March 1918, May 1919, and was last bred March 11, 1920. Regular estral periods occurred after that service. On November 1, 1920, an examination for pregnancy was made by a private practitioner. He diagnosed a mummified calf and invited the Ambulatory Clinic to see the case and assist in removing the mummy. We made an examination two months later. A hard mass could be palpated over the anterior border of the pelvis as large as a six-months fetus and occupying about the same position as a normal pregnancy. The mass was irregular in shape. It appeared like the head and one leg of a fetus. The uterus could not be retracted and neither ovary was located. We had no hesitancy in confirming the diagnosis. It was arranged to attempt to remove it on February 1, 1921.

The private practitioner, the Ambulatory Clinic, and a veterinarian, who was doing special work on the diseases of the reproductive organs of cattle, were present at the time of the operation. All examined the case and were satisfied with the diagnosis. It was decided that a laparotomy would be necessary. The animal was given a drench of six ounces of alcohol diluted in an equal quantity of water. The narcotic effect was excellent. The operation was performed in the usual manner with the animal in the standing position. The mass of fat was located where the mummy was supposed to be. It was too large to be removed through the laparotomy opening. The animal was then slaughtered for beef. Many fat tumors were found in various

parts of the abdominal cavity. The one that had caused the trouble surrounded the horns of the uterus and completely covered them as well as the ovaries. The mass weighed thirty pounds, was irregular in shape and somewhat resembled a six-and-a-half-months-old fetus when palpated through the rectal and uterine walls. The pancreas was not examined. The tumor was brought to the laboratory and a diagnosis of fat necrosis was made.

The diagnosis was made on two other cows in this herd during the following year. These animals would not breed and were sent to the slaughter house. No autopsy was made on them. The tumors were smaller than in the previous case and several instead of one could be palpated *per rectum*.

The fourth case was diagnosed in a pure-bred Guernsey cow, which is breeding regularly but aborted the last calf. The tumors were found during the examination and treatment that followed the abortion. The tumors were not larger than a walnut but several of them could be palpated in the region of the uterus.

The fifth case was in a pure-bred Guernsey with a somewhat interesting history. This cow was born June 27, 1916, and dropped a normal calf March 9, 1919. On February 17, 1920, a monstrosity was removed with considerable difficulty. Six treatments were given for the lacerations caused by the delivery. The cow was pronounced cured and ready for service April 8, 1920. A normal calf was dropped February 3, 1921, and a dead one March 17, 1922. We were asked to examine this animal again April 20, 1922, for udder trouble and a case of catarrhal mastitis was found. The milk had slugs in it for a time but recovery soon followed. On the same date a rectal examination was made and fat necrosis was diagnosed. There were several masses within reach. The largest was located in the left pelvic region near the cervix. It was estimated to be three inches long, two inches wide, and about one inch in thickness.

The next examination was made November 2, 1922 and the animal was found open. The largest lump had nearly doubled in size. An examination was made again on November 14th by two experienced veterinarians in consultation with our Clinic. All agreed that the condition was fat necrosis, but the genital organs were normal and it was decided to breed the cow the first estrum. This animal had made the advanced registry in milk production. For this reason and on account of the good blood lines progeny was much desired. Estrum soon followed.

Service was given, and the animal being nearly dry was sent to the dry-stock barn.

During the holiday vacation this beast was taken sick with what appeared to be an obstruction of the bowel. The local veterinarian was called and treatment according to his direction was followed for ten days when death occurred. Unfortunately a veterinarian was not present at the autopsy. The abdominal cavity was opened by an intelligent layman who reported that many fat tumors were found in the abdominal cavity and that to him they had much the appearance of suet. One mass of fat had surrounded a loop of intestine and closed the lumen so the contents could not pass it.

If the diagnosis of fat necrosis was correct in this case one might wonder whether the pancreas might have been injured in delivering the monstrosity two years previous to the discovery of the condition and if so would it have shown evidence of the injury at the time of death.

Where this condition is suspected the animal should be kept under observation, a careful autopsy conducted and especial attention given to the pancreas. It would be interesting also to know whether cases of fat necrosis might make a spontaneous recovery. Our diagnosis in none of these cases except the first was confirmed by autopsy findings and the pancreas was not examined in this one.

The diagnosis of fat necrosis might properly be questioned in the last four cases yet we feel that it is correct. A properly conducted autopsy would be the only method for settling the question correctly.

YOU CAN'T FOOL YOUR WIFE

A certain sportsman went out for a day's rough shooting. He was not a particularly good shot, and so he got nothing; but since he was rather ashamed to return empty-handed, he bought a hare in the town on his way home.

He presented the hare to his wife, who, after responding with the usual congratulations, thoughtfully remarked:

"Do you know, it was a good thing you shot that hare when you did, John; it wouldn't have kept another day."—*Youth's Companion*.

PERIODIC OPHTHALMIA

By A. SAVAGE

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The amount of attention which Canadian veterinarians in the B. E. F. were called upon to give to "specific" ophthalmia is the writer's chief excuse for reviewing an affection that happily is of no great economic importance in this country. And if in addition to refreshing the interest of former officers the following remarks will help modify the conceptions of the disease held by those practitioners who have not seen it in a position of serious prominence, he will feel somewhat justified in committing them to paper.

Unfortunately, the names of the disease are misleading. It is not necessarily periodic, neither has it any connection with the moon; its specificity has never been proved, and it does not invariably terminate in blindness. Moreover, blindness is a condition, not a disease. The word "ophthalmia" has reference to the eye, but is objectionable in these days of precise diagnosis because the eye, like most other parts, contains several distinct structures. Uveitis is more nearly correct, while the terms cyclitis, iritis and choroiditis, used singly or in combination, express the real state of affairs. To the objection that these names are without etiological significance, is the reply that so are most of the cases one meets.

In its occurrence the disease makes no discrimination between sexes, and it may appear in any stage from birth to senility. The lymphatic type of horse is considered by many to be more susceptible than the clean-legged, fine-boned breeds. Statistics do not show that season has much influence, but rather that affections of this sort are fairly evenly distributed throughout the year.

Geographically, however, its occurrence is different. Most literature on the subject accuses the low lands of Flanders and Northern France of being veritable hot-beds of ophthalmia, and exempts the higher altitudes. Certainly irido-cyclitis seemed exceedingly common among the horses of the B. E. F. in these countries. Statistics when published, however, will not afford a suitable collection of animals elsewhere for comparison, nor will they mention that for the compilation of Army Returns by

officers in the field "specific ophthalmia" was usually synonymous with "something wrong with the eye."

The causes are many. Inflammation of the uveal tract has been observed following blows on the ocular globe; it occurs commonly enough as a complication of or sequel to contagious pleuro-pneumonia and other severe septic conditions; and it may appear as a primary and separate affection.

It is concerning the etiology of primary uveitis that so many theories have been advanced. The writer has known otherwise serious-minded veterinarians to accuse everything in connection with horse management, except grooming and shoeing, of bringing about the disease. Water, feed, air and exercise, heredity, various parasites and infection have all been regarded with suspicion, but as none of them except the last can be practically dispensed with, they deserve no comment.

IS THE DISEASE INFECTIOUS?

The infection theory is a popular one. Various micro-organisms and parasites have been found in the eye by different investigators. None of them, however, typically reproduced the disease. Quite recently Dalling¹ published an account of a bacillus isolated from the optic nerves of affected horses which he thought "if not the actual cause of specific ophthalmia, was at least one of the causes, probably acting with others." His work has not been confirmed.

On the contrary, Knowles², using strains of the bacilli isolated by Dalling, concludes: "It is therefore difficult to reconcile the findings of Dalling with the observations recorded here, firstly, because in the latter no growth of the 'nerve bacillus' or any other bacillus was obtained from the optic nerve in typical cases of recurrent ophthalmia, and, secondly, because no specific agglutinin for the 'nerve bacillus' was present in the serum of the cases examined."

The old dogma of Rolland³, that the disease is fundamentally rheumatoid and due to Klebs' organism, is a difficult one to disprove, especially in so far as the first statement is concerned. Nicholas⁴ dismisses the subject by saying, "Though brought up from all sides, the contagion theory seems hardly admissible. In any case we do not possess a single document worthy of establishing it."

The onset is usually rather sudden and may in some cases be accompanied by distinct systemic disturbances. Unfortunately those local symptoms that would otherwise be revealed through

the ophthalmoscope, are often masked by a diffuse keratitis, which renders examinations of the internal parts of the eye impossible.

Lachrymation, edema of the lids, photophobia and pain, as expressed by resentment at having the part examined, are usually present. In severe cases the head may be lowered or even held on one side. Pericorneal injection, a symptom to which much importance is attached by some, is not invariably present, nor is it easily detected in certain eyes. In cases involving the posterior parts of the uveal tract it may be absent.

Iritis, or irido-cyclitis, as manifested by a discolored iris, and probably in the course of time a collection of pus in the bottom of the anterior chamber (hypopyon), together with the formation of synechiae which may not be recognized until afterwards, constitute the commonest form of the disease.

STRUCTURES INVOLVED

Rolland³ dogmatized that the disease in question was an iritis and nothing more, and that the formations of adhesions between the iris and the lens capsule was inevitable. Conversely he held that the detection of synechiae in otherwise healthy eyes "gives one the right to affirm with entire certitude that the eye is affected.."

The inflammatory process, however, need not be limited to the anterior parts of the uveal tract, nor conversely is there any valid reason why the choroid cannot pass through the various stages of acute inflammation without involving the iris. A severe exudative choroiditis may detach the retina, leaving it floating in a pathologically changed vitreous. Pressure resulting from the same condition, if confined to the back of the eye, because of a complete posterior synechia, sometimes causes a pressure paralysis of the retina without actually displacing it. Such a condition is often referred to as amaurosis or "pop-eye," when the acute stages have passed.

Between the iris and the choroid lies the ciliary body which, as a matter of clinical observation, is generally involved both in cases of iritis and choroiditis. The most serious, direct effect of cyclitis is to detach the suspensory ligament of the lens, allowing that medium to fall free or nearly so into the fundus of the eye, or to be pushed forward against the cornea by pressure in the vitreous.

Needless to say, inflammation of the various parts of the tract

may occur in different combinations and degrees of severity. In some cases the exudative stage is hardly reached, the eye recovering from such attacks with little or no permanent change. In others the entire vascular coat is involved, the inflammation severe, the exudate abundant, and the eye rendered permanently useless by one attack of panophthalmitis.

The course is naturally varied, both in its duration and in the complications which may ensue. Average cases clear up in approximately a week or ten days.

Among the sequelae of anterior uveitis are various forms of corneal opacities, anterior synechiae (resulting from organization of a hypopyon), partial and complete occlusion of the pupil, posterior synechiae and cataract.

There seems to be a certain concurrence of cataract and posterior synechia. Rolland stated that the latter of these always eventually provoked the former. The writer, examining 130 eyes affected with cataract, found 107 of them with posterior synechiae. On the other hand, he has observed many slight synechiae, the kind that break down under atropine, leaving only a shadowy spot on the lens capsule, and which in the course of many months of observation showed no sign of inducing cataract—either capsular or otherwise.

RECURRENCES

Concerning the recurrence of the disease, it is dangerous to say much. The writer knew one animal that developed an iritis in one eye only, but accompanied by constitutional disturbances, approximately once a year for three years; he eventually went blind from cataract. As an example of the opposite type, he had a saddle mare for his own use that became affected in each eye alternately at regular intervals of one month. (As she was invariably in oestrus at the time of these attacks, her usefulness can be imagined. To say the least, her behavior was unlady-like).

On this point Nicholas writes, "When we say that iridocyclitis from any cause and in any species is recurrent, it shall be the reason for which we accept neither the qualification 'periodic'—which is inconvenient because it hints at a fixed period of time between attacks—nor that of 'recurrent' which to be more realistic, is not on that account any more exact."

The prognosis varies with nearly every case, depending upon the number of previous attacks, and the extent and severity of

the one under observation. Considering the probability of recurrence and the eventual formation of cataract, or other lesion leading to loss of vision, it is always sufficiently grave for the eye concerned. Sympathetic affection of the other eye, which sometimes follows iritis in humans, it not to be feared in the domestic animals.

In treatment a certain discrimination can be used. Obviously a first attack in a valuable animal calls for different procedure than one would adopt towards a scrub beast affected for the tenth time or a horse convalescent from pleuro-pneumonia.

On general principles the animal should be put at rest. Failing that, the eye may be rested by covering it with a suitable pad so as to exclude light. For the purpose of endeavoring to eliminate the cause, hydrogogue cathartics, diuretics and alteratives are indicated. Of the last class of agents, potassium iodide given *per os*, in progressive quantities of from 20 to 40 grams per day, was recommended by Dor in 1900. Other writers have not altogether agreed on its merits.

As revulsants, cupping, bleeding and blistering have been employed in the temporal and periorbital regions. An improvement in the application of this principle is probably the basic reason for Wigg's⁵ treatment, which consists of injecting 1 cc Lugol's solution deep into the orbital fat and repeating, if necessary, in about a week, or when the reactionary swelling has subsided.

LOCAL TREATMENT

Concerning the eye itself, there are a number of useful medicines, outstandingly atropine and cocaine. The former of these, by paralyzing accommodation and dilating the pupil, prevents the formation of posterior synechiae. It also reduces intraocular pressure, diminishes hyperemia of the iris and ciliary body and puts the parts in question at rest. Cocaine, while not so mydriatic, has the additional merit of being a local anaesthetic. An easy and satisfactory means of application consists in using an ointment of 1% atropine hydrochloride and 1% or 2% cocaine hydrochloride, in a base of white vaseline. This applied under the lids once daily, in quantities about the size of a pea, exerts a continuous effect and saves the annoyance of repeated aqueous instillations.

Adrenalin is also indicated, and may be used in "drops" along with atropine and cocaine, the usual form in which it is

marketed not being miscible with fats. Mollereau, Porcher and Nicholas⁶ give the following prescription and advise covering the eye with a pack soaked with 3% aqueous solution of potassium iodide.

Cocaine hydrochloride.....	2.0
Potassium iodide.....	2.5
Glycerine.....	16.0
Distilled water.....	100.0

A few drops to be instilled into the eye morning and evening. (The cocaine may be omitted when hyperesthesia is no longer present.)

In the absence of an attack, demonstration beyond controversy that any particular eye has or has not been affected with some form of uveitis, is not always possible, though in many cases if a suitable examination is conducted, one can find permanent changes of structure. The point is of legal value under many conditions. Many of the states in the U. S. A. have legislation prohibiting the importation for breeding purposes of stallions affected with periodic ophthalmia "in any form," amaurosis and cataract. In France the disease is a *vice redhibitoire*; its appearance in a horse within 30 days after sale renders the transaction legally void.

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WAR'S ANIMAL VICTIMS

Westminster City Council, London, England, have sanctioned a proposal for the erection of a memorial in Hyde Park to all the animals that lost their lives in the war. More than £2,000 have been collected for the purpose by the Royal Society for the Prevention of Cruelty to Animals.

The animals to be commemorated range from mice and small birds used in the detection of poison gases to the elephants that were killed while on heavy transport duty.

There were 364,130 British horse casualties in the war. Dogs engaged for various purposes died in thousands. *Canadian Veterinary Record*.

REDUCTION OF TORSION OF THE UTERUS¹

By JOSEPH W. VANSANT, *Fox Chase, Pa.*

During twenty years in general practice, largely devoted to cattle work, I have developed a great interest in cases of dystocia. For years, I dreaded to find upon examination of a cow in labor that I had a case of torsion of the uterus with which to deal. In such cases, although I never failed to turn the uterus eventually, I was unable to tell what part of my long hard tedious work was accountable for the results. This prevented me from gaining confidence in myself from previous experience to handle the condition. Several years ago, therefore, I decided to operate on one of these cases and successfully reduced the torsion by manual manipulation inside the abdominal cavity. Since this time, I have operated on a number of cows and one large sow with very satisfactory results.

My method of procedure in such cases is to make a vaginal examination and ascertain the extent and direction of the torsion. In case the cow has not been eating well for a few days and shows a somewhat empty gastro-intestinal tract, I proceed to operate at once. When the rumen is quite full and especially if the cow is very fat, I order her starved out and given Glauber's salts in one-half to three-fourth pound doses every three to four hours until the stomach and intestines are well emptied before the operation is started. While operating, it is preferable to leave the cow standing in the stanchion with a nose leader in her nose if this is necessary. The skin on the left side just posterior and superior to the point where the trochar is inserted in performing rumenotomy is clipped or shaved and washed. An incision is then made through the skin downwards and forwards about four inches long or large enough to admit the hand and arm. The index finger is used to separate the muscles in the direction of their fibers and the peritoneum is punctured with a knife in case any difficulty is experienced in pushing the finger through it into the peritoneal cavity. The right hand and arm are now thoroughly washed and may be rubbed with carbolyzed vaseline and introduced through the incision into the abdominal cavity. An examination is first made of the position of the calf and condition of the uterine walls. Great care must be used during manipulation not to push the fingers through the uterus. This is avoided

¹Reprinted from Univ. of Penna. Veterinary Extension Quarterly, No. 3.

by working with the flat of the hand pressed against the calf at a point where the hand can make an indentation against the fetus, forming a ledge. In cases where the uterus feels like a round ball and its walls are swollen and oedematous so that the calf can not be definitely outlined there is particular danger of puncturing it during manipulation. It may also be difficult to turn in this condition on account of the hand slipping over the smooth surface when rotation is attempted. Under such conditions considerable help may be obtained from two assistants with a strong piece of wood about six feet long and two to four inches wide.

To illustrate the use of such assistants, let us consider that we are dealing with a uterus pregnant in the left horn, which has undergone a full turn so that the left horn has revolved completely around to its original position on the left side. To replace it, the left horn must be pushed down across the abdomen and brought up on the right side and back into place. It can readily be pushed down and across, but the operator cannot reach far enough to keep the hand under it and raise it. By removing the hand to get into another position from which to lift, we lose what has already been gained on account of only having one hand with which to work. Therefore, when we have pushed the horn down and across we have the assistants one on each side of the animal with the board passed under the abdomen. The man on the side with the operator (left side) raises his end of the board, pressed firmly against the animal, then he will lower his end as the man on the opposite side raises, keeping very firm pressure against the abdomen. This will let the operator get his hand under the uterus again and also materially help to raise it up and over into place. When the torsion is reduced, the peritoneum and muscles are sutured with uninterrupted catgut sutures. The skin incision is sutured separately with strong thread. In case the uterine walls are thickened and the *os uteri* is not well dilated, it is better to wait for twenty-four hours before attempting to deliver the calf, otherwise, we may proceed with delivery at once. Thickened uterine walls are liable to rupture when traction is applied in removing the calf. When delivery immediately follows the operation, it is well for an assistant to hold a cloth moistened with disinfectant over the incision to prevent air from passing in and out of the abdomen during the contractions and relaxations of labor.

The majority of these cases can be replaced in about five

minutes after the hand is inserted into the abdominal cavity and the position of the uterus ascertained. In one case, a complete turn was replaced in about one minute as it seemed to simply roll over like a ball. From my experience it seems to be the most logical method for practitioners to use in handling these cases.

**ALUMNI DAY—VETERINARY SCHOOL
UNIVERSITY OF PENNSYLVANIA
JUNE 16, 1923**

Come all ye loyal Penn men now

From practice, lab and clinic.

Lay down your work and worries for

The royal Red and Blue

Dean Kleinie has his coat off

Old C. J. is ready too.

All for a good, old, care-free time

Come back on Alumni Day!

(Apologies to "The Red and Blue")

It is agreed that the above is pretty bad but the point is that every Penn man who fails to heed the call will regret it as long as he lives.

Alumni Day, June 16th, 1923 is to be a day of jollification and a reunion in every sense of the word. Every man who has had veterinary problems bothering him and hoped to get some information, when he goes back to school on Alumni Day, can button-hole the man with whom he wants to talk "shop", but there will be no "shop" talks on the program.

The day will start with a short, snappy business meeting at 9.30 A. M., daylight saving time. Immediately following the business meeting the fun will begin. Come prepared to roll back the years and become a freshman once more.

After "doings" in the court-yard, lunch will be served, ample opportunity being given for classes and old cronies to get together.

Every man will want to see the new stadium. Tickets for the ball game will be provided. We will either take part in the Alumni Day Parade, or view it and the ball game, in a body.

Mark this day on your calendar—JUNE 16th,—and be on hand at the Veterinary School, University of Pennsylvania at 9.30 A. M., daylight saving time.

R. M. STALEY, *Secretary.*

WHY THE STATE VETERINARY DEPARTMENT DOES NOT RECOGNIZE THE RETEST OF REACTORS*

By J. G. FERNEYHOUGH, *State Veterinarian, Richmond, Virginia*

As far back as 1898, Nocard, one of the world's greatest authorities on bovine tuberculosis and the use of the tuberculin test, wrote the following: "The observation of a clear reaction to the tuberculin test is unequivocal; the animal is tuberculous." Nocard then goes on to say that it often requires prolonged and minute researches in the depths of all the tissues to discover the few miliary centers, the presence of which had been revealed. "The reaction is absolutely specific." The Bureau of Animal Industry, in one of its very recent official programs, had the following in large print. "DID YOU KNOW THAT ONCE A REACTOR ALWAYS TUBERCULOUS?"

Personally, I have been using tuberculin since the year 1896, when, as a student, I commenced work under the State Veterinarian who was at that time located at the State College, at Blacksburg, Va. In those days when tuberculin was just being introduced as a diagnostic agent, it was not an uncommon practice to hold reactors and submit them to a retest in from 60 to 90 days. However, it was soon observed that nothing but confusion, loss of time in the work, and the spread of tuberculosis would result in the practice of retesting reactors. Therefore, for these reasons, after I was appointed to take official charge of the work (over twenty years ago), I recommended that in Virginia we would not recognize the retesting of positive reactors. Because in this State, we are testing cattle to control and eradicate tuberculosis. While we love to advertise a man's herd as "free from tuberculosis," when we believe it to be free, yet the true results of the tuberculin test must clearly indicate that this is a fact, before it will be given a clean bill of health—it matters not who the owner happens to be, or what his opinion is. The responsibility of the work rests on the State Live Stock Sanitary Board and the State Veterinarian. Therefore, for the good of the work, we are going to be as careful as possible.

Let me cite you a case: An animal reacted, and then the owner, who I thought was keeping her in quarantine, had her retested. She passed the retest. She was a fine, registered Guernsey cow,

*Read before the annual meeting of the Virginia State Veterinary Medical Association, Richmond, Va., January 11, 1923.

and after keeping her several months, the owner was offered \$1,000 for her. This man believed the cow to be healthy. He thought the men who marked her as a reactor had made a mistake. In order to ship her interstate, he had her tested again and she passed. Now follow me closely; this cow reacted, then passed two tests O. K., made by different veterinarians. The owner then told me what had happened, and said that my man had made a mistake in the first test. I considered the matter carefully, and then took the position that the first test was correct.

The animal had reacted, and I would not recognize the two tests which she had subsequently passed. The owner had sold her, and shipped her to South Carolina. I informed the purchaser that he had a reactor in his herd. This new owner then had the U. S. B. A. I test her again, with the subcutaneous test. This she passed. They then applied the intradermic test, and she passed again. I was still not satisfied and said: "No, she is a reactor." She was slaughtered and found to be tuberculous, and the disease was of long standing. The man who sold this cow thought he was right; the man who purchased her was satisfied until I called her a reactor. They are both gentlemen, and the one who sold her returned the purchase money, and he is today a good friend of mine, since he found I was right.

I dare say there are few veterinarians who have had any experience with the retesting of reactors, who have not been forced to the conclusion that after an animal once gives a positive reaction to the tuberculin test, she may in the future pass several tests, giving no sign of a reaction, although she is tuberculous. Just why this is true, I cannot say; nevertheless, knowing it to be a fact, I cannot pass animals as healthy after they have once reacted. To do so is unfair to the herd owner, if he does not know any more about the test than to want his reactors retested, and if he still desires to have them retested, after it has been explained to him that often reactors will pass subsequent tests, although the animals are tuberculous; then such a herd should be let alone by all honest veterinarians.

If a herd owner wishes to sell tubercular animals, let him take the chances, but do not allow him to put the responsibility on the veterinary profession. I notice that the man who wants his reactors retested never wishes to buy reactors from some one else. If these men do not believe in reactors, except when it suits them, we had better let them alone. Else, such men will

ruin our profession. In my opinion, no man should be persuaded to retest a positive reactor unless he desires to destroy his usefulness as a veterinarian in this State.

The conclusion of the matter of retesting reactors is this: We know they will often pass subsequent tests though they are tubercular. Therefore, as professional men, we are robbing the honest man when we retest his reactors, and take his money for the work. If we retest reactors for dishonest men, and pass them as healthy, we are at least subjecting ourselves and our profession to criticism which we deserve. We are retarding the control and eradication of tuberculosis by leaving tubercular animals in herds which are supposed to be healthy. When we retest reactors and pass them as healthy cattle, not only are we helping the owner sell his diseased cattle, as healthy ones, but what is worse, we are inviting the honest man who has cleaned his herd to go and buy from a herd in which there are reactors (TUBERCULAR CATTLE).

Retesting reactors and classing them as healthy when they pass the test, is, in my opinion, fraud on the part of the man who does not know what he is doing. Therefore, for the good of the country at large, it should not be done. "ONCE A REACTOR ALWAYS TUBERCULOUS."

Now, gentlemen, let me appeal to you as Virginia veterinarians. You have a reputation throughout the country for your honesty, as well as your professional ability. Let no man's money tempt you to retest his reactors. It matters not how prominent he may be socially, politically or otherwise, do not let him use you to pass his tuberculous animals. Remember gentlemen, when you are right you will have no cause to fear any man, or men. You are ABSOLUTELY RIGHT when you refuse to retest reactors for any man.

DOCTOR A. S. BURDICK HONORED

Doctor A. S. Burdick, President of The Abbott Laboratories, of Chicago, was elected President of the American Drug Manufacturers' Association at their recent meeting in New York.

The American Drug Manufacturers' Association is composed of the leading pharmaceutical manufacturers of America and the Association has for its object the improvement of conditions in the pharmaceutical field.

THE PRACTICAL VALUE OF POULTRY VACCINES AND REMEDIES*

By E. D. ENSIGN, Bryan, Ohio

The use of vaccines and bacterins in poultry practice at the present time seems to be somewhat limited. Many practitioners have paid little or no attention to chickens or their diseases. Consequently they are largely at sea in making a diagnosis and in prescribing treatment. In our practice during the last four or five years we have had a limited poultry business. Our results in some cases have been very pleasing; in others they have been very much the opposite.

Our experience has been principally with fowl cholera and roup. In fowl cholera the vaccine treatment as a whole has been very unsatisfactory, both as a cure and as a preventive. We vaccinated a number of flocks for cholera about two years ago. In two or three instances the results were very gratifying, but in most cases the treatment, if anything, increased the rapidity of death. However, medicinal treatment has proved much more satisfactory. We have used several drugs for this ailment, but bichloride of mercury, in drinking water or soft feed, or both, has given very good satisfaction. Sometimes all treatments seem to fail. In these cases it may be a disease other than fowl cholera, about which we know nothing.

For roup and chicken-pox the vaccine treatment usually gives very satisfactory results, both as a preventive and as a cure. However, in advanced cases, unless the birds are very valuable, we believe they should be destroyed, as the treatment of these usually extends over a long period of time (three to six weeks) and the average owner becomes disgusted and resigns, either killing the bird or allowing it to die from the disease and its complications. Where the infection is slight, or during the early stages, one treatment will many times clear it up; but usually the affected birds should have two or three treatments at three- to five-day intervals.

Medicinal treatment also seems to have a place in combating this disease; such as removing the cheese-like deposits and painting the lesions with some good antiseptic. The administration of intestinal antiseptics in the drinking water or soft feed is of

*Read before the annual meeting of the Northwestern Ohio Veterinary Medical Association, Toledo, Ohio, February 28, 1923.

some value, and here again we depend principally upon mercuric bichloride. Sanitation is very important in treating roup and we advise lots of fresh, dry, clean litter, plenty of fresh air, no drafts, and as much light and sunshine as possible.

Ptomaine poisoning is best treated by removing the cause, such as decomposed meat, etc. Coccidiosis we do not know much about, but thorough cleaning of the pens and moving the birds to clean, uninfected ground or grass seems to get good results. In tuberculosis there is no medicinal treatment, the remedy being to dispose of the entire flock, thoroughly clean up and disinfect. Then apply the tuberculin test to the cattle and maybe eliminate the source of infection.

From the standpoint of making money, poultry do not seem to be included in the veterinary practice law. They enter into practice as a side-line, from which you can only occasionally make a dollar. Some of our supposedly reliable and ethical veterinarians, from whom some of us have had considerable instruction, and by whom we have been taught many rules concerning professional ethics, seem to be perfectly willing to prepare poultry vaccines and furnish the same to laymen, with syringes, needles and full instructions for the administration of their products. Their representative goes out and vaccinates poultry for any one who calls upon them to do it and also serves as an instructor. The vaccine is furnished to the consumer at a price which is less than a veterinarian can buy it for, from a good, reputable, biological company. Naturally their results are not always satisfactory, and as a result the veterinarian occasionally gets a call. However, unless this condition of affairs can be overcome, the future of poultry practice for the veterinarian does not offer much encouragement.

A GOOD SYMPTOM

"There's only one good thing about that young puppy that came to see you last night," said the angry father, "and that is he's healthy."

"I am surprised to hear you admit that much," replied the dutiful daughter.

"I wouldn't except for the fact that when you met him in the hall last night I heard you say—'Oh, George, how cold your nose is'."—*Judge*.

ON THE PROPHYLACTIC VALUE OF IODIZED TETANUS TOXIN¹

KINMATSU OKUDA

(From the Veterinary Laboratory, Ministry of Agriculture and Commerce, Nishigahara, Tokyo, Prof. N. Nitta, Director.)

It is well known that animals may be protected from tetanus infection by the previous injection of tetanus antitoxin and the immunity thus produced lasts, however, only for a short time (a few weeks). To our regret there has been no safe and practicable method of inoculation against tetanus yet, which confers a long-lasting immunity on animals treated.

In the year 1917 Vallée and Bazy published a method of active immunization against tetanus. After demonstrating that injections of tetanus toxin attenuated by the addition of an iodine solution (iodine, 1; potassium iodide, 2; distilled water, 200) conferred a solid immunity on the rabbits treated, they treated 7 seriously wounded persons (who had received prophylactic injections of antitetanic serum) with the iodized tetanus toxin at the military hospital at Bégin; the patients received 3 subcutaneous injections at intervals of 5 days, 1 cc and 2 cc of a mixture containing 2 parts of toxin and 1 part of iodine solution, and finally 5 cc of a mixture of 3 parts toxin and 2 parts iodine solution. The French authors concluded that this method of injecting the iodized tetanus toxin is safe and confers a long-lasting immunity.

The writer carried out a series of experiments to ascertain the effect of Vallée and Brazy's method. To obtain the tetanus toxin the tetanus bacillus was grown aerobically in "liver-piece broth" with the addition of 10-20 percent fresh blood (the blood of cattle, horse or sheep is equally usable), and the lethal dose of the toxin thus obtained is usually 0,00001-0,000005 cc for a mouse of about 10 grams, 0,0001-0,00005 cc for a guinea pig of about 400 grams, and 0,001 cc for a rabbit of about 2000 grams. As the experimental animals used were a great number of guinea pigs and rabbits, and a few sheep, goats and horses.

The writer found that a mixture of tetanus toxin and iodine solution in proportion of 2:1, as proposed by Vallée and Bazy, is dangerous to guinea pigs and rabbits, the whole of the former (37) and a majority of the latter (7) developing tetanus, and

¹Reprinted from the Journal of the Japanese Society of Veterinary Science, March, 1923.

mortality being about 60 and 43 percent respectively, while that in proportion of 1:1 is quite safe for both kinds of animals. Two injections of the mixture of 1:1 (1 and 2 cc) and third injection of that of 2.5:2 (4.5 cc) conferred a solid immunity on guinea pigs treated, which resisted the control inoculation of a lethal dose of the toxin, with no reaction.

It is much easier to immunize rabbits, one treatment being sufficient for this purpose, when used in a dose of 2-4.5 cc of a mixture of 1:1, 2.5:2, 2:1.5, 1.5:1 or 2.5:1.5.

In goats the immunity was produced by two injections of 2 cc of 1:1 and 4-4.5 cc of 2.5:2 or 2.5:1.5. Sheep and horses were also immunized by two injections of 5 cc of 1:1 and 8 cc of 2.5:1.5.

The iodized toxin retained its prophylactic value for about 40 days after being mixed with the iodine solution.

TRIALS WITH TUBERCULOSIS VACCINE

For years scientists have sought a way to reduce by means of a vaccine the ravages of tuberculosis. W. D. Frost (Agricultural Bacteriology) and assistants have made some progress by using tubercle bacilli, killed by means of ultra-violet light, as a vaccine, for which the name of *tubuvase* has been suggested. It was shown that the process of manufacture would kill the tubercle bacilli, rendering the method safe, also that the vaccine had considerable preventive properties.

Inasmuch as the proper dosage of *tubuvase* is not known, Mr. Frost proposes to continue the experiment by using much larger quantities of the vaccine. Recent experiments indicate that more than one hundred times the former maximum dose may be given with perfect safety.

When it is considered that from 25 to 30 percent of the hogs killed in this state are tuberculous and that most other farm animals are more or less subject to it, any disease resistance which could be built up in the bodies of the little pigs by means of *tubuvase* would be of great economic importance to Wisconsin, and it seems desirable to continue this work with the hope of reaching the goal which science has so long sought. *Bulletin 352, Wisconsin Agricultural Experiment Station, February, 1923.*

A SIMPLE METHOD OF HANDLING PROLAPSE OF THE RECTUM IN HOGS¹

By J. E. SEVERIN, Athens, Ga.

The method is not original with us, but gives such uniform results and is so easy to use that we are constrained to urge others to try it. It consists of ligating the protruding rectum with a strong cord on a section of metal tubing. Metal tubing is used in order that the lumen of the gut can be kept open so that defecation may continue in a normal manner.

We made our first tube from a two-inch section of a large cork borer one-half inch in diameter. On the outside of each end of this cylinder was soldered a wire ring. These rings were placed about the tube in the same manner as a hoop is placed at each end of a barrel. They serve to hold the tube in place and to keep the ligature from slipping. Later we found that common garden-hose menders, which are nothing more than small corrugated brass cylinders, worked just as well.

To apply the tube, lay the hog on its back or restrain in any other convenient manner. Put traction on the everted gut until sound tissue is exposed and insert the tube until about half of it is within the anus. Then with a strong cord ligate the gut close up to the anus *as tightly as possible*, being sure that the bowel is securely caught between the encircling ligature on the outside and the hollow tube placed in its lumen. The ligated portion should change color in a few moments from a livid red to a dark blue if the ligature is placed properly. In some cases the ligature may have to be readjusted or tightened in a day or two. The isolated stump of the rectum sloughs off in five or six days with little local reaction.

It is important that constipation be relieved, before resorting to this procedure and it is advisable to feed sloppy feed, in which liberal doses of mineral oil have been incorporated, in order to facilitate the passage of feces.

The operation is effective, bloodless, can be performed in a few moments without anesthesia and causes only temporary inconvenience to the patient.

¹Reprinted from *The O. S. U. Veterinary Alumni Quarterly*.

CLINICAL AND CASE REPORTS

(Practitioners and others are invited to contribute to this department reports of unusual and interesting cases which may be helpful to others in the profession.)

TUBERCULOSIS IN A HORSE

By R. L. CONKLIN, Veterinary Department, Macdonald College, Quebec

On March tenth, the writer was called upon to perform an autopsy upon a horse which had died suddenly while at work. The animal was an aged gelding, weighing about 1250 pounds, of draft type and used for slow, farm labor. It was known that the animal had suffered with 'heaves' for two years. This animal and the other horses kept on the farm were housed in the cow stable with reacting cattle.

As far as could be ascertained from the driver, the animal did not exhibit any symptoms of illness previous to death. The animal was being used in the field when it suddenly dropped to its knees, groaned, protruded its tongue, which had lost its color, quivered and died.

Autopsy:—The animal was in very good condition. There was no evidence of struggling previous to death. The hair coat was dry and well kept. The tongue was protruded and pale. It was observed that the mucosae of the lips, eyes and about the nose were pale. From the history and the condition of the mucosae, it was suspected that the animal had died from internal hemorrhage.

The following observations were made upon opening the abdominal cavity:—Little gas present in the intestines, absence of blood in the mesenteric vessels, liver was greatly enlarged and covered with purulent and caseous areas, 1 c.m. to 5 c.m. in diameter, the left kidney was nearly twice the size of the right, and upon incising it a calculus of the shape of a jack-stone was found in the hilus, the cortex containing many small caseated areas. The other organs appeared to be normal.

When the diaphragm was perforated a great quantity of blood poured through the incision. The left lung was found to have been ruptured from its anterior to posterior extremity along the dorsal portion. Both lungs contained numerous caseated and

small purulent areas up to 2 inches in diameter. The pericardium was thickened and the heart hypertrophied. The weight of the heart alone was found to be 16 pounds.

Sections of the liver, kidney and lungs were brought to the laboratory for examination. Results of the laboratory examination and sectioning of the tissues proved that the lesions were tubercular.

Death was due to internal hemorrhage from the ruptured lung.

This case is of much interest since it shows the susceptibility of some equines to tuberculosis, when they are exposed to the infection. This animal was no doubt a spreader, and would have been a source of great danger on a farm with an accredited herd.

The question also arises as to the relation of the tubercular trouble and the 'heaves'. Was this animal affected with emphysema or did the tuberculosis cause the symptoms to be exhibited. I am inclined to believe that the tuberculosis was indirectly the cause of the hypertrophy of the heart, and the direct cause of the symptoms of the 'heaves'.

ANESTHESIA IN THE DOG BY INTRAVENOUS INJECTION OF A MIXTURE OF ALCOHOL, CHLOROFORM AND PHYSIOLOGIC SALT SOLUTION

By HENRY CARDOT and HENRY LAUGIER

(Communication from the Laboratory of Physiology of the Biologic Research Institute of Sevres. Abstracted and translated by C. Nielsen.)

"Although the anesthetic effect of intravenous injections of alcohol, ether, or chloroform solution have been experimented with a number of times (Burkhardt, Hagemann, Grehant, Honan and Hassler, Sick) this method of anesthesia has never been introduced in general practice. The recent publications by Koshiro Nakagawa, in which is given a bibliographic resume of the question, have prompted us to describe a technic which we have used frequently in the dog and which has given satisfactory results.

"Series of experiments, which it will not be necessary to describe here, have finally lead us to employ the following solution:

Water	100.0 gm.
Sodium chloride	0.8 gm.
Chloroform	0.6 gm.
Alcohol, 95%	8.0 gm.

"Since it is preferable to diminish as much as possible the quantity of the solution injected intravenously, the animal is given an injection of 1 centigram (1.6 grain) of morphine hydrochloride per kg. one hour before the anesthetic is given, such as is the routine in many laboratories before chloroform anesthesia by inhalation (Dastre's method). In the morphinized dog an intravenous injection of 5 cc of the solution per kg. of the animal produces in an extremely rapid manner, almost instantaneously, an intense, profound and short anesthesia. The injection of the solution must be made rapidly and without too much handling. In this manner a profound sleep is induced, with disappearance in a few seconds of corneal and labiomental reflexes and considerable elevation of the threshold of the lingual-maxillary reflex. Furthermore, the blood pressure is lowered, the rate and amplitude of the respiration becoming considerably diminished. Sometimes (though rarely, if the proper doses are given; more often with larger doses or repeated injections at short intervals) a temporary dyspnoea more or less complete develops, but rapidly disappears again. We have never had any accidents with the proper doses.

"The results show that this method, which is quite convenient is particularly indicated in the cases where a very profound and very short anesthesia is required; this is of particular value in operations on the face and on the respiratory tracts."

(We hope some canine specialists will give this method a trial. Our own experience in giving, or attempting to give, intravenous injections in dogs indicates that it will not be a popular method unless they are much more skillful than we are. *N. S. Mayo.*)

THEY GOT WHAT THEY DESERVED

Fines of \$100 and \$50 respectively were assessed recently, by Circuit Judge William B. Brown, against L. J. Osinga and Earl Ball, Byron Township (Kent County, Mich.) farmers charged with attempting to interfere with tuberculin tests being made by veterinarians from the State Department, at Lansing.

Both men pleaded guilty, and the sentences followed a protest from Judge Brown regarding lack of knowledge of laws tending toward the protection of public health.

The men admitted having injected turpentine into the tails

of their cattle, in order to interfere with the intradermal injections. Osinga was given the heavier penalty, as he admitted having actually performed the operations, both on his own and Ball's cattle.



Two "T (turpentine) 2x" Reactions

(Photograph supplied by Dr. B. J. Killham)

ABSTRACTS

PATHS OF INFECTION BY *BACTERIUM ABORTUS* IN RABBITS, GUINEA PIGS AND MICE. Everet S. Sanderson and Leo F. Rettger. Jour. Inf. Dis., 1923, 32, p. 181.

In their experiments the authors attempted to produce infection with *Bact. abortus* in guinea pigs, mice and rabbits by mouth, and guinea pigs and rabbits through the vagina and urethra. The results show that infection of these animals was easily brought about through these three avenues and that of the three species the mouse appears least susceptible. These observations form an interesting contrast to those carried out on cattle in recent years, especially by Rettger and White, who demonstrated the extreme difficulty of artificially infecting the bovine genus.

The authors, in their experimental work, do not regard positive serologic reactions in themselves as absolute proof of existing infection, but do regard them, except in very young, nursing animals, as indicating either present or recent infection and that consequently they are of great value in the study of transmission in cattle and other animals.

The results obtained by the mating of previously unexposed with artificially infected and reacting animals were negative. These experiments were few in number and actual mating was not observed. Their attempts to bring about infection in cattle through the vagina have often proved unsuccessful. The results also show that there probably was a transmission of agglutinins and other antibodies from the mother to suckling offspring through the milk.

S. S.

A COMPARISON OF THE ZIEHL-NEELSON AND SCHULTE-TIGGES METHODS OF STAINING TUBERCLE BACILLI. Hyman L. Shoub, Jour. Bact., 1923, viii, 121-126.

The technic of the Schulte-Tigges method* of staining tubercle bacteria is as follows:

"1. Flood the slide with carbol-fuchsin (10 cc of saturated solution of basic fuchsin in 95% alcohol, and 90 cc 5% carbolic acid).

2. Heat the slide to steaming and continue the heating for one minute. Avoid excess heating.

3. Wash off the excess stain with tap water, and decolorize in sodium sulphite (10 percent aqueous solution of sodium sulphite). This solution should be renewed once per week and if convenient twice a week.

4. Wash *thoroughly* with tap water, and counterstain with picric acid (saturated aqueous solution of picric acid).

5. Wash with tap water, dry, and examine. The tubercle bacilli are red, the background is pinkish yellow."

By comparative tests on human sputum the author concludes that:

"1. The Schulte-Tigges method of staining tubercle bacilli is not more difficult than the Ziehl-Neelson method; it is easier.

2. It gives about 33% more positives.

3. It exposes over five times as many organisms.

4. It does away with the use of alcohol."

It is believed that the superiority of the method is due first, to the fact that sulphite appears to clarify the slides better than alcohol and second, that picric acid as a counterstain obscures fewer organisms than methylene blue."

W. A. H.

*Schulte-Tigges, H. Deutsche Mediz. Wchnschr. 1920, xlii, 1225.

AMERICAN VETERINARY MEDICAL ASSOCIATION
Proceedings of Fifty-ninth Annual Meeting, St. Louis, Mo.
August 28 to September 1, 1922

(Continued)

LARGE-ANIMAL CLINIC

THURSDAY MORNING, AUGUST 31, 1922

(Continued from p. 110, April Journal)

The meeting convened at eight-fifteen o'clock, Dr. Kingman presiding.

CHAIRMAN KINGMAN: I had the opportunity, last winter, of listening to a course of lectures given by Dr. Ferguson, upon the same subject he will talk about this morning, and if you knew the material that he has to give you, you would be willing to go a long ways to hear him. Dr. Ferguson, of Lake Geneva, Wisconsin.

DR. T. H. FERGUSON: Gentlemen: We will first review the the anatomy of the udder. The udder, as you know, is located on the bottom of the abdominal wall, in the inguinal region, and consists of two symmetrical halves. Each half is covered by its fibro-elastic envelope, and they are joined together in the center by areolar tissue. Each half has a distinct anterior and posterior quarter. Although there is no line of demarcation between them, they are separated by areolar tissue.

Now, while mentioning this areolar tissue, I just want to call your attention to the fact that in mastitis a good many times the two capsules of each half become adhered, the areolar tissue becomes organized, so in dissecting half of the udder a good many times it is a little bit difficult, if mastitis has existed for a long time.

Now, as I said before, the anterior and posterior quarters are distinct quarters; that can be demonstrated by injecting a blue solution in one and a red solution in the other. There is absolutely no connection, but for the surgical relief of chronic conditions, it is not wise to try to remove one quarter. You must remove half of the gland, unless the quarter affected is necrotic and has separated, and is only attached by the blood-vessels. Then the proper thing to do, of course, is to remove that necrotic part and ligate the blood-vessels.

The circulation, the blood supply to the udder, is the external pudic artery external pudic vein and the abdominal vein, *vena subcutanea*. The udder is well supplied with lymph-vessels and glands; the supramammary glands are situated superiorly and posteriorly. The skin and superficial parts of the udder are also supplied with lymphatics. The milk is secreted by little epithelial cells and poured out of these through little hair-like canals into the larger canals, several of which go to make up a lobule, and they, in turn, empty into larger canals and finally into the milk cistern, and from the milk cistern to the orifice of the teat through what is known as the milk duct.

The distal end of the milk duct is surrounded by a sphincter muscle, there being none in the superior part of the teat, near the cistern. There is a folding of the mucous membrane there, but there is no sphincter muscle. Sometimes there is muscular tissue there, but there is no well-defined sphincter muscle, like there is in the end of the teat. Now, I just mention those conditions because in treating mastitis, or in treating the udder with intra-mammary injections, it is well to remember those facts, and then you won't get in bad. Now, in amputating an udder, the one necessary thing to do is to get all of these blood-vessels; if you are taking out one-half of the udder, these blood-vessels, the vein and artery, also the nerve and lymphatic vessels should be ligated *en masse*, with a very strong ligature. If you ligate those before you dissect out the other part of the udder, you won't get very much hemorrhage. It is a little bit difficult, but it can be done nicely and they should be ligated *en masse*.

Now, each half of the udder is surrounded by a fibro-elastic capsule. This extends in between the lobules and forms interstitial tissue. The parenchymatous tissue, as Dr. Klein told us the other day, may become inflamed, and that is known as parenchymatous mastitis. The interstitial tissue may become inflamed and that is known as interstitial mastitis. He also explained the catarrhal mastitis, the mastitis that affects the mucous membrane of the teat duct, or the cistern, or going higher up and affecting the canals.

I think I will just say a word about obstruction of the teat first, because that is a condition that we are called upon to take care of probably more than any other one condition, and the causes of obstruction of the teat are many. The teat may become injured on the end, by another animal stepping on it,

or by the animal itself. So "treading" is one cause of injury to the end of the teat or to the teat that may cause obstruction.

Another cause is frost bites. A teat may become frosted and swollen, so that it is impossible to milk. To relieve the quarter of the milk, it has to be done some other way. The teat very often becomes infected on the end. This infection may spread through an entire dairy. You may have a lot of cases, in fact, most every cow in the barn may have an infected end of the teat. You would think by looking at it that it was due to an injury.

There is a little red ulcer right at the orifice, and the end becomes swollen and it is impossible to get the milk out. A cow may have one or more of her teats affected that way, and several cows in the same herd may be affected. Then the teats may be obstructed by cowpox, gaining entrance to the orifice by metastasis, and causing an obstruction of the end of the teat. Then again, catarrhal mastitis may cause obstruction of the teat anywhere above the orifice, and it even may extend up into the milk cistern, and into the larger canals. That is probably the cause of more trouble than any other condition that we have to deal with.

Very frequently we get this kind of a history of a case of obstruction that is caused from catarrhal mastitis. During the process of drying the cow up, the owner had difficulty in getting all the milk. Maybe there was more or less pain there, and he had some trouble in getting the milk, but thought the cow would be all right when she freshened. Upon freshening there is more or less complete obstruction, anywhere from the upper part of the lower third of the teat to the cistern, or even involving the cistern.

These obstructions, caused by catarrhal mastitis, may consist of a little tumor, from an eighth to a quarter of an inch in size, up to a condition that is called "spider." It extends from one wall of the teat to the other, completely occluding the lumen of the teat. The milk will come down to that portion of the teat and it is impossible to get it further. You may be able to force out a squirt or two from the end of the teat, but it won't fill up again for some time. That is commonly known as spider.

Then, again, you may get a membrane extending from one wall to the other, just a thin membrane, like a little diaphragm across the lumen of the teat. Catarrhal mastitis probably causes more trouble with a teat duct than any other one thing, although there are plenty of cases caused by these other condi-

tions I mentioned. That little infection that you will see spread through a stable, manifest by swelling, and a little ulcer at the end of teat, is quite a nasty condition and it is one that needs prompt handling in order to prevent a lot of damage.

Now for handling those cases where the obstruction is in the end of the teat, there are a good many ways that have been tried with more or less success, but the one that has given me the most satisfaction in all cases, although I don't adhere to this operation in every case, is the dividing of the sphincter muscle. I don't like to use or have a teat-tube used, because it is the history with using teat-tubes that most every cow develops a case of mastitis from the use of the tube. The owner may be a pretty careful man, and he may think that he is handling the thing clean, but his idea of cleanliness isn't always a good idea of surgical cleanliness. He may wash his hands and sterilize the tube and forget to disinfect the teat tip and orifice, and may crowd a little dirt up there, or may forget one of the other things to do, and most always, if you leave a case of that kind to be handled with a teat-tube, the cow loses that quarter from mastitis. So, in handling these cases in practice, it doesn't matter particularly what caused the trouble if the sphincter muscle is in shape so that it can be operated decently.

We usually operate with a concealed bistoury from the inside. Of course, there are rare cases that are hard, maybe for a space a little above the sphincter muscle, so that just dividing the sphincter muscle will not help that kind of a case. In those cases we just amputate the end of the teat.

And again, a teat may be so badly lacerated that it isn't practicable to try and save the end. If great damage has been done, it is better surgery to amputate that teat at once. In a good, substantial teat, with pretty fair length, there is usually enough muscular tissue in the wall, so that nature can form a new sphincter, which she does in a good many of those cases. If you make the amputation carefully, and under antiseptic precautions, take care of the post-hemorrhage and the teat goes on and heals. Nature very often takes care of the sphincter end of it and especially in cows with well-organized teats, good, big, long teats. They very often turn out to be as good as they were in the first place.

I had one Guernsey cow with extremely long teats. I had to amputate a portion of her teat twice, and eventually she made a nice recovery. That is, twice at intervals of probably a year.

Now most of us used to, in operating on teats for obstruction, take a teat bistoury, figure-eight a rope around the cow's hind legs, clean the end of the teat, maybe tie the cow's head to one side, introduce the teat bistoury and pull it out, once, twice, three or four times. I used to do that same thing, and I wondered why I couldn't cure a case now and then. Once in a while I accidentally would have pretty fair luck, and one would be improved, but the majority of them didn't do well, but since I started to just work on the sphincter muscle (and I have a great many cases where it is impossible to milk them out and almost impossible to introduce the tube into the lumen of the teat after dividing the sphincter muscle two or more times, as I think indicated) there is no trouble in milking that teat out right away.

There is one little danger afterwards, and that is that it might close up again. Any man that has had experience in the handling of those cases usually has no trouble in keeping them open without using tubes, but when I start to operate for some new dairyman, who hasn't had the experience of the average, I very often, after operating on them, burn a common match down about two-thirds of the way, roll a little absorbent cotton around the black part, dip that into a little etherized iodine or iodoform, and screw that up into the orifice so that it presses well against the incisions that I have made in the sphincter muscle. That usually holds the part open in nice shape, and at the same time it disinfects the wound nicely with just one application.

I don't usually do that unless it is some new man, whom I am just starting to do the operation for and who hasn't had any experience with the after-care. Very often he will have great difficulty in getting the milk the next morning, and very often he will telephone to us that the operation wasn't successful, that he can't get any milk, and we will go out there and do just what we told him to do and be able to milk the cow right out in nice shape, without doing any more than we instructed him to do. But it is a little better, if the man isn't very intelligent, to put the little plug in the end of the teat. It won't do any harm and it certainly will in many instances do a lot of good. Now that operation will take care of a pretty bad teat in nice shape. Of course, there is a necessary after-treatment in all of those cases, and I have found this out: that the man who follows out the after-treatment religiously has very good results with these cases; the careless man does not have as good results.

A short time ago I was called to operate on a very good cow

for a man. We had done the operation several times for him, and the fourth time he said to me, "I hope we will have better luck with this cow than we had with the rest of the cases."

I said, "Didn't you always have pretty good luck with these cases?"

He said, "No, we haven't had good luck with them."

I said, "That is rather curious; the majority of such cases come along very satisfactorily."

I asked him if he took good after care of the teats according to directions.

"Oh, yes, fine."

Now, we always leave a bottle of concentrated bichloride to follow up the after-treatment with, and I just happened to look in his medicine cabinet and I saw two or three bottles of this concentrated lotion that we had left there at different times. Some of it had cobwebs on it and some was dusty. He hadn't been using it. He hadn't been trying to help out the operation a bit; he had just been depending on the operation to cure these cows, and he hadn't been getting good results.

Now the after-treatment that I recommend has worked out very nicely. It isn't complicated; it is simple; it requires carrying out to have the best results. If the teats are handled in this way for several days, say three or four days, before and after milking, twice a day, then no further attention is necessary. By that time the teat will have come along in pretty good shape, and nature will take care of it. But for the first two or three or four days it is absolutely necessary to take nice care of the end of the teat.

Now as to this solution we use. When an ounce is added to a pint of water, it makes a one-to-a-thousand bichloride solution and I have found nothing better. I have tried iodine, glycerin, and most all of the different antiseptics, and I find that just that simple little antiseptic, applied hot, by soaking the teat in a little egg-cup or a little glass, for a minute or two, in a hot solution of bichloride, that we get the very best results, and that is all that is necessary to be done. Of course, the owner must rinse off his hands, too, before he milks; that is a good precaution. It is surprising how well those cases do, and how little infection we get in them.

Now, I believe that the last time we figured up on the percentage, we got pretty close to ninety-five per cent good results on these cases that appeared to be caused from an accident, or

from that little infection that I was telling you about, that caused a hard end; we got pretty close to that percentage of good results.

The after-treatment, of course, looks simple. It would appeal to lots of veterinarians that it didn't really matter, and that it would be insignificant to wash off the end of the teat. A lot of boys who have come to work for me would suggest iodine or something else. They would think that was better, but it doesn't work out so well. Iodine causes the end to become too dry, and other preparations odorize the milk. There is no odor to bichloride of mercury solution, and you won't get in bad like you would with iodoform, or some preparations that odorize the milk. We have been using that for about fifteen or eighteen years, almost exclusively, and we like to use it hot and in that strength solution for those conditions.

Now, we have a regular procedure, of course, in doing these operations. As I said before, we didn't have very many cases that respond to the treatment. Now we have a regular system for handling them. We come in and make the examination while the cow is standing, and if we decide to operate we paint the teat with etherized iodine. Just give it a good painting all over. Take a piece of cotton and wipe it all off thoroughly. Be sure and get some in the orifice, right in the teat, and then we lay the cow down.

The method that I prefer is the double, half-hitch method. Put a rope halter on the cow, snub her head to the ground, a half hitch around the neck, a half-hitch back of the shoulder and one in front of the external angle of the ilium. You are all familiar with that hitch. It is the best way of restraining a cow for a short or long operation that we have found.

After we get her down, we stretch her front feet one way, and her hind feet another, to two posts, usually; have the ropes long enough so that you loop a rope around one foot and give it a twist, and then loop it around the other. Then run the end of the rope around a post and back through. Then you can stretch the cow out in nice shape. After she is stretched, we tie the tail to the upper leg, because if you don't, just at the critical time, when you are going to start things, she will switch that tail around and hit your instruments or soil your hands.

We slip on rubber gloves; we have the instruments sterilized, and we boil them if we have to take time. We don't operate with dirty instruments. If a fire isn't at hand, we drop them in phenol, in 95 percent phenol, let them soak in there a little

while, and then rinse them off with alcohol. We have the instruments clean; then we slip up and do this simple little operation. Then put a little more etherized iodine on the teat and let her up. In those cases where we plug, we plug while she is down.

Now, formerly, I used bougies in a good many of those cases, and we had about the same experience with bougies that we did with the teat-tubes; infection would follow using them. We had the best results with a lead bougies and silver bougies, but I find that if you just burn match down to a point, pick up a little cotton with it, twist it, dip it into a little etherized iodine or iodoform, and screw it up in there, it will answer all the purpose that a bougie would, and in addition it disinfects those little wounds that you make. That is left in there until the next milking; I don't advise putting it back. We just introduce those plugs and the owner takes them out. He is instructed to just twist them out.

Now, I think I have covered everything. Relative to the operation for obstruction of the end of the teat, that can be handled by operating on the sphincter muscle. There are two or three other little operations that we do. I mentioned one of them; that is amputation. Where you can't successfully operate on the sphincter muscle, then amputate. There is another way of handling those, and that is to take a little knife, a thin-bladed knife of some kind, and just ream them out, starting in the center of the tip, introduce the knife through the orifice, and just ream them out a little. In some cases, where they are very hard and fibrous on the end, that is the best way to handle them. You take out just a little of the tissue right in the center. Take out enough so that you will get a free flow of milk, but if it is a heavy-milking cow, and she is on a full flow of milk, don't take out too much because if you do you will get a leaker.

Now, speaking about leakers brings to my attention hard milkers. We operate on a great many hard milkers. Those Holstein cows that are giving upwards of sixty or seventy pounds a day will just about wear out the man who milks them, and we operate to make them easy milkers. We have got it down so that we come pretty near making them do as we want them to. The operation is just the same as for obstruction of the teat. The operation is done on the sphincter muscle. This little, concealed knife is introduced through the orifice, pushed above the sphincter muscle, opened up and the cutting point introduced at the superior part of the sphincter muscle. You carefully

cut through until you can hear it pop. If you decide to divide it more than once, the next division won't make quite so much noise, but in a good, hard sphincter it will make a little noise, and then with the others you can just judge by the lack of resistance, when the blade goes through.

That, I believe, is about all I can think of relative to the relief of obstruction of the teat near the end. We have conditions, as I mentioned before, higher up, spiders and tumors and such. Now, when it is possible, I try to operate from the inside. After you get beyond the sphincter muscle here, most teats have plenty of room. There is plenty of room in the duct as I will show you. I will open up one; and you have quite a lot of room in there even if there is a constricted part up above. If you introduce a director first, and then either a very small pricking-knife, or an ordinary pricking-knife, into the groove and get it up in there, you can use it to quite an advantage. Withdraw the director and you can engage this tumor with the finger and thumb on the outside, and do quite a lot of operating on the inside of the teat. If you dissect this tumor loose, and it is too large to force out, after the orifice is dilated and the sphincter is dilated, why then it may be necessary to break it up or to cut it up with a knife before trying to get it out.

If I don't think that I can operate successfully by introducing an instrument in the teat duct, I prefer then to cut right down onto and through the growth, dissect it out, and, depending on the case, either suture or not, as conditions may warrant. I have operated both ways, and I have had a little better results with cows on milk by leaving them open, although a cow may be operated upon successfully, on a full flow of milk, if the proper kind of a drainage tube is used. The drainage tube should be a silver tube, long enough to go above where you have made the dissection, and it should be perforated at just about the sphincter muscle, so that it will drain the duct down to that point of the teat. If the tube does not have such a perforation, milk will flow down and collect around the sphincter muscle. A hole should be drilled. I will demonstrate what I mean.

You won't get good results from suturing unless you sew up the duct as much as possible, and then sew up the skin. There are cases where the growth is quite large, where you won't be able to do that, so you will have to depend on just sewing through the wall of the teat, putting in the proper sutures.

Now, I will just show you how I cut the sphincter muscle; it

is a very simple operation. I use just a common little bistoury, not just like this, but it will do. I don't usually have as long a knife as that. The cow would be lying down, that would be about the position of the teat and we will presume this is a hind teat. We would introduce the bistoury into the duct. Now, this cow has a very delicate sphincter muscle, so you would have to be careful with a cow of this kind and not cut her too much.

Just engage the knife blade at the top of the sphincter muscle, take a good hold and try not to injure the orifice or the mucous membrane on the end. I didn't do that as I usually do; I don't pull them through. Now I will try another instrument. We will just take this big udder right here. The idea is to put the bistoury right in there and get it up above the sphincter muscle. I think I have just a common bistoury in my pocket here, and I am going to get it. I will show you it can be done more successfully than with the other. We use this almost exclusively because we don't like to be bothered with a lot of instruments, and we have got results this way. There is certain care that you have got to give these little bistouries to have them working well. You must keep them sharp and well cleaned out on the inside so that they will actually work. We have them of different shapes, but this is a pretty fair shaped one; it hasn't got a set-screw on, but we can use it just the same.

You must remember that operating on dead tissue is altogether different from operating on a live case, but we will try to show you on this. We are careful not to cut way through. You want to cut through the muscle, but not through the wall of the teat, or we don't want to injure the orifice and make it bleed. Once in a while, with a bad bruised end or a bad infected end, we just divide the muscle right through the very wall of the teat, and we get quite a lot of bleeding. In those cases the packing with the match and the cotton is indicated. You can see that is milking easier right now. Now the old way would be to just stick in the knife like that and rip her down through. That is the way I find it commonly done by veterinarians, and they don't get good results.

It is a game of experience, getting the hard milkers just right. After you have done a lot of them you can get them so they will milk just about right, and they won't be leaking. Now you don't get a hemorrhage in hard milkers very often, if you operate carefully and confine your cutting just to the sphincter muscle.

Of course, if you accidentally cut the duct or cut a little vessel in

the wall, you will get quite a little hemorrhage, but, of course, those teats that are injured on the end are very apt to be bleeders. The average treatment is just the same as for operating on an obstructed teat. It consists of washing the teat off before and after milking with a warm solution of one to a thousand bichloride of mercury. That is the treatment I have found best; it is cheap; it is economical, and the reason we put it up in concentrated solution is this: if you dispense the tablets, a man takes a tablet and dissolves it in a pint of water—that is, he throws it in a pint of water. The first part is weak and the last part is caustic, but if you pour the concentrated solution into water you get it all alike. It is just about the right strength; it will disinfect it in pretty good shape.

DR. MOORE: In amputating the end of the teat, do you insert anything like a soft rubber tape or anything of that kind.

DR. FERGUSON: I will just show you how we do it. We always lay the cow down. If we haven't much to do with a cow, we just lay her down and do it right. For a few years I got just a little bit lazy, and thought I could do a job standing up, and do it decently, and every time I have gotten in bad, so we don't make any bones about laying them down. In the first place we clean up the teat in nice shape, and then we slip a rubber band around the teat, right up at the base. Then we take a pair of forceps; of course, everything is supposed to be sterilized. We try and save all of the teat that we possibly can, even if the swelling extends up; all the teat we think will regenerate, we save, even if it is hard and swollen up above, so we will pretend that this teat has been macerated and is in bad shape and we will take that teat off right there.

You will notice with that kind of forceps your teat will be left in about the right shape. Now if you were to take off this rubber, it would bleed profusely, so we will just run the rubber down here and leave it on about two or three hours. Of course, disinfect the end of this thoroughly with some iodine, pure tincture of iodine. The follow-up treatment is just like it is for all teats, one-to-a-thousand, warm, bichloride solution. We leave that rubber on for about two hours and a half or three hours, and then we have the owner cut it.

It leaves a bloodless job; you have a fine finish to the job when you are through. Now, I will just take off another one here so these gentlemen can see.

DR. MOORE: Does that have a tendency to close that duct?

DR. FERGUSON: No sir, the milk runs right out, just like it is running out now, and runs more or less continuously all day long depending on the cow. It will run quite profusely, depending on the teat, for a week or two, then it will keep diminishing, and in a favorable case will get down so you will have to milk it out. Once in a while a cow with a weak wall never will form a sphincter. In those cases you can slip a rubber band right around the end. If you put on a clean rubber band right at the very end, it will cause irritation enough so that there is quite a little connective tissue thrown out and organized there, and that will make a pretty fair end of an otherwise bad teat. Usually nature does pretty well with those teats. Now, a good many times I make a little injection of cocain, or something of that kind, around the wall of the teat.

Now I will show you how we operate a fistula. I can't locate one except this old, rotten fistula from a diseased quarter. A milk fistula occurs anywhere from the lower part of the teat, right up to the cistern, or it may occur in the udder, up above the cistern, in one of the canals, but usually right in this location here. I can't very well show you how to do a fistula that doesn't exist, but I will show you the general plan of it.

We get the cow down, and we get the rubber on it first. Get the teat clean, slip the rubber band up above here, and then make a little injection of cocain around the orifice of the fistula. Now, presuming that black spot was the fistula, we would inject a little cocain right around there, then we would make an elliptical incision right through like this. Now that would include the epithelial tract that leads from the skin down to the duct which causes your fistula. Of course, it doesn't exist in this case, but I am going to show you how we dissect it out. We just slip a pair of forceps on the skin like that; take a pair of scissors and dissect that right out, right down to the duct. When you get through, you almost think you have a fistula there, but it isn't, of course. You dissect it out, the little epithelial tract that extends from the skin to the duct, and then you have the problem of suturing it. I just took the connective tissue; the duct is right here; I will cut that out.

Now, in suturing that up, we have to use a special stitch, or it won't hold. There are two or three ways of sewing. Where I want to include the duct in the suture I sometimes make a figure-eight stitch, which isn't hard to make, and it very often takes care of it in fine shape, so I will just show you how I do

that. I want to show you two ways of stitching these; either one may be successful. I just start in the skin here first, like this, just take it through the skin, bring it right over, slip her down through the duct. Now, I have been down through the duct and looped over and then back through the skin. That makes a figure-eight suture that folds the duct together and the teat at the same time.

Here's another one I use and like first rate, and that is just a through and through suture, taking in plenty of the wall of the teat, so as to get a good, firm amount of tissue. It is just the simple suture that you are familiar with, only you forget about them sometimes where they are useful. There are the two stitches.

Now, I will just do an operation for the removal of an obstruction. Here's one hard tumor right in the end; here's one that can be cured; there is a teat that can be cured by operating on the sphincter muscle, I think, right there. You can feel that hard swelling in it, just like a round hard marble. Now you see we just cut right through that growth. There is the duct and there is the part I operated on; you can see the incision right through that hard bunch. That would relieve that condition; that would let the milk out in nice shape. You can see how much space there is in a duct; you have quite a lot of room in there to operate after you once get in.

The gentleman asked about the cases where the obstructions are up high. I has been my experience, if the obstruction is up in the cistern, it is very apt to be up in the larger canals and those cases are hopeless. The best thing to do with them is to leave them alone in the majority of cases, and you will get pressure atrophy. If you do molest them, or try to operate them be very careful that you handle them in an aseptic manner, because if you don't you are liable to infect the quarter and get a mastitis that might prove fatal, not only to that quarter, but to the life of the cow.

DR. WAY: What about that little place where the teat sets on?

DR. FERGUSON: That is the high part, and those we operate right at the base of the teat, but I have found that the higher

QUESTION: Do you wait until there is acute inflammation up you go the less apt there is to be success.
before you operate?

DR. FERGUSON: There isn't acute inflammation in those cases; they are usually chronic cases; they follow catarrhal

mastitis. Of course, there is congestion there, that very often occurs at parturition time; then you would have to operate to relieve the teat if you were going to do the operation, so you couldn't hold it up. You would have to go ahead and operate just the same.

QUESTION: Would you operate on a fresh cow that way?

DR. FERGUSON: You would have to have it done that way on a fresh cow. If you were called to a case where they couldn't get the milk, and you located the obstruction in any part of the teat, it would be up to you to decide what was best to be done with that, or whether it was best to do anything with it or not. If you think you can operate on it from the inside, from within the duct, why that is the best thing to do. If you can't do it that way, then the next best thing is to cut right down upon the growth and through it.

Of course, you want to use a local anesthetic and make the job clean. If it is up pretty well you cut right through the wall of the teat, just like that incision is made, right down through the growth, and then you just dissect out that growth like I am doing here now on this good teat. There is no growth here, so we will just take out a piece, but there is generally plenty of evidence of growth, so it doesn't make quite as long an incision as that, but don't be afraid of an incision. The fellow who makes a little bit of an incision, and tries to get in there and operate, is out of luck, because he will never do a good job. Make a big enough incision, so you can get what you want to do and get it out in good shape.

It is a good plan to have an assistant help you, and in a good many cases it is the farmer that helps you. You take a loose pair of forceps and slip a rubber tube over the ends in order not to hurt the end of the teat, and an assistant can hold that teat out so you can operate with instruments. We don't get our hands in it; just cut down through there and dilate it.

QUESTION: What is the after-treatment?

DR. FERGUSON: That is for you to decide; if you leave the wound open, the milk runs out. The after-treatment is to treat it with iodine, about twice a day, for three or four days, and then about once a day, and just let the milk run out. A great many times it is followed by a milk fistula, but sometimes it will heal up. If you are going to use the tube, then you introduce a silver tube right in the teat, one that has been perforated down here, just above the retainer, so that you will get drainage. If you

have it perforated from this point down here through this hole just above the base, there won't be any question about it. When you do that you suture the wall of the teat in nice shape and put a dressing on there. Collodion is very good. Dry the teat well and paint on a little collodion, a little cotton and a little more collodion and so on, and you can put a band around there in good shape.

QUESTION: How long do you leave that teat-tube?

DR. FERGUSON: About eight or ten days.

QUESTION: What do you think of etherization of the udder?

DR. FERGUSON: That is all right in some cases, if you put a little iodoform in the ether, but I am not very strong for etherization.

It seems I am taking up another man's time, and I am going to quit. (Applause).

CHAIRMAN KINGMAN: We have taken some of Dr. Joss' time, and it is too bad; we owe him an apology for it. I have listened to Dr. Ferguson for two weeks at a time, and I know just how interesting he is, but we have to divide it in the way it should be divided and give every man his share, so, Dr. Joss, we are sorry that we infringed upon your time.

DR. J. W. JOSS: It is entirely alright.

Gentlemen, hog cholera is a septicemic disease, it being contagious and infectious, and may be acute or chronic. The disease is characterized by hemorrhages of the tissues, complications of the intestinal mucosa, and by less frequent hemorrhages of the lungs. The manner of infection is either direct or indirect. The characteristic symptoms of hog cholera are a rise of temperature, loss of appetite, staggering gait, the weakness being most marked in the hind quarters, rapid loss of weight, constipation followed by diarrhea, which persists until the death of the animal.

In order that you might observe the ante-mortem symptoms of this disease, we have arranged to show you eight pigs which are at this time eligible to release for the production of either hyper-immunizing or simultaneous virus, as the case may be, and if some one will please drive the eight cholera-affected pigs into the holding-pen before us, I shall try to demonstrate the actual ante-mortem symptoms of hog cholera to this clinic. While this is being done, we shall discuss a few of the lesions which are given particular attention when such animals are autopsied at licensed serum establishments.

In my opinion one of the best indicators of hog cholera is the

congested and inflamed cervical lymph glands, especially in pigs which have been sick for but a few days. The mesenteric chain of lymph glands is considered next in importance, but in advanced cases of the disease.

Following this, a careful examination is made of the lungs, petechiae often being found, as well as pneumonic areas. Examination is made of the kidneys and petechiae are almost constantly found in them, where pigs have been inoculated eight days, and which have shown three-day sickness. If the everted bladder is carefully examined, you will frequently find petechiae scattered over the surface. Oftentimes an examination of the inner lining of the stomach will reveal that it is highly inflamed, and I have been informed by those who are supposed to be experts in the diagnosis of swine diseases that it might be the only lesion found in the first animals dying in a herd of swine affected with hog cholera, and I shall now show you a few of the stomachs, which are inflamed, removed from pigs sick of hog cholera for two days, being killed seven days subsequent to inoculation.

I do not believe that the stomach lesion is considered very important by many practitioners, probably because it is difficult in the field to examine it, it being necessary to wash the interior thoroughly before it can be properly examined. It is my opinion that you will find at least 80% of the stomachs of animals affected with hog cholera quite well marked with inflammation, and this often applies to pigs which have been killed on the seventh or eighth day subsequent to inoculation. I might state in this connection that pigs of this class should show visible symptoms of sickness for at least two days, and preferably three. This makes more certain your diagnosis of hog cholera than it would be to kill the virus pigs after one day of sickness.

A few lymph glands have been collected and will be passed around for your observation. The first of these are all diseased with hog cholera. Towards the latter part of the display we shall pass around some cervical glands, which were taken from hyperimmune hogs, apparently healthy at the time of post-mortem examination, and you can easily see the difference between the normal and those that are affected with hog cholera.

Some of these glands are not so very well marked with inflammation, while others are. You will find this condition existing in a hundred head of pigs that might be killed on the 7th day following inoculation with virus. Those of you who are practic-

ing, probably conduct autopsies on pigs after they have succumbed to the disease. In those cases I suspect it is probably about 15 days from the time of infection that they die, and that you find lesions more marked than in these cases, but it is suggested that you examine the lymph glands carefully in your first animals that die, and it will aid you materially in making the proper diagnosis.

On the little tray that has the normal glands you will observe no inflammation. Those were collected from hyperimmune hogs which were bled for serum purposes this morning.

The next most common lesions that we find are the petechiae of the kidneys, and I shall pass these around for your examination. You can see the hemorrhages on the surface. These lesions would be more marked if they had been collected from animals dying on the 15th day following exposure to the disease.

The lesions which you have just seen were collected from pigs killed seven days subsequent to inoculation. The inner surface of the bladder should always be examined, as in most cases petechiae or well-marked inflammation is found. The gland with the large area of inflammation was taken from a hog that was condemned at one of the establishments having Federal meat inspection, and you will note that it is much more marked than any of the others.

Here is a stomach taken from a pig that was inoculated seven days prior to killing, for hyperimmunizing virus. The inflammation is very extensive. Here is a normal stomach, taken from a hyperimmune this morning, and you can observe the difference. There is no inflammation, while on all the other specimens you will find this quite marked.

QUESTION: Do you always find stomach lesions in hog cholera?

DR. JOSS: I believe you will find them in 80% of the stomachs opened and carefully examined.

QUESTION: You find petechiae on the kidneys more than that, don't you?

DR. JOSS: Yes, especially where the disease is more advanced. In my opinion the cervical glands and bladder are the best indicators for the diagnosis of hog cholera. Occasionally you will find petechiae in the kidneys of hogs which are apparently healthy.

Here is the skin lesion of a hog that probably had cholera existing in its system for at least twelve or fifteen days. You will notice the large area of inflammation on the surface of the skin.

This is the ileo-cecal valve, and you will find some ulcers near and surrounding the valve.

This is a section of the vertebrae, taken from the same hog from which the skin lesions were collected. The bone has bleached some, but you can see that it is much darker than the normal vertebrae should be. Sometimes they are quite black, and I believe if the practitioners are in doubt as to the cause of the death of the animal, it will aid them if a longitudinal section of the sternum is made, as the bone in advanced cases will be dark, this condition being characteristic of hog cholera.

These are the lungs from the animal from which the section of the bone and skin lesions were taken. There is considerable pneumonia present. The larynx and trachea often show intense inflammation, as well as petechiae. By observing this trachea and larynx you will see that inflammation is present.

Your attention is now directed to the pigs in the ring. These animals were inoculated on the 24th of August, today being the seventh day following inoculation. They were inoculated with a virulent strain of virus, receiving three cc subcutaneously. These pigs remained well up to and including the fourth day; on the morning of the fifth day they commenced to show visible signs of sickness. The temperatures of these animals this morning are 107.5°F., 106.2°F., 107.2°F., and 106°F. The temperatures yesterday were 106.6°F., 106.2°F., 106.8°F., and 107°F. The Bureau requirements are that if they are well, up to and including the fifth day, we do not take the temperature until they show visible signs of sickness. These pigs will be killed this afternoon. You can notice they have lost weight rapidly, their backs are more or less arched and they are rather indifferent to surroundings, and I think most of them will lie down in a short time, showing effects of the disease.

The three pigs that we have here before us, were killed this morning and were out of the same bunch from which these four were selected. In conducting the autopsies of these animals, the cervical glands at the angle of the jaw are both incised. We do that to see if the animal is affected with either cholera or tuberculosis. The lungs are examined, the kidneys, the spleen, the intestines and the bladder. The spleen in seven-day pigs, I believe, is practically normal. You will not find in it much enlargement nor any alterations in pigs that have been inoculated, say seven days prior to killing. It is very unusual for you to find any splenic lesions, but as the disease progresses, along about the

twelfth or fifteenth day, then you will find a soft, dark and enlarged spleen, but not in the seven-day pigs.

Now, are there any questions? I believe my time has just about expired. I might state that the mesenteric chain of lymph glands is very important in diagnosing hog cholera, too. You will find them highly inflamed in advanced cases, just like you do the cervical glands and it is very important, I think, to have these examined. (Applause).

CHAIRMAN KINGMAN: Dr. Cahill has consented to discuss the subject of necrotic enteritis. Dr. Cahill. (Applause).

DR. CAHILL: Gentlemen, I don't know why I was selected to talk on this subject unless it is because there is so little to say. I think the only sensible way for us to feel about necrotic enteritis is that it is a secondary condition. There are cases where one feels that he is dealing with a primary etiological factor that is responsible for acute enteritis, and in these cases it has been found that *Bacterium paratyphosum* is usually an etiological factor, but I think all men who have had much experience with necrotic enteritis are agreed that they are seldom called until after the disease has passed this stage. The cases more frequently seen are those of a chronic nature, affecting rather a small percentage of the herd, and usually a sequel of some other condition. It is generally characterized by chronic emaciation and a progressive weakness and loss of flesh.

We frequently hear this condition spoken of as intestinal necrobacillosis. I think it has been so thoroughly proven that this name is erroneous that it needs little discussion. *Actinomyces necrophorus* is not capable of causing necrotic enteritis, if our present information regarding this organism is correct. Those who have worked with that particular organism have been unable to reproduce necrotic enteritis.

Actinomyces necrophorus is very frequently found, however, when sections or smears are made from the intestinal mucosa of infected pigs. It is found in very much the same manner as the same organism is found in other conditions, and, therefore, it should be considered, not that this is necrobacillosis, but that *Actinomyces necrophorus* is afforded an opportunity to cause pathological changes, characterized by necrosis, only after some other organism has set up the primary focus and made conditions favorable for *Act. necrophorus*. Not all investigators are agreed regarding necrotic enteritis. I think, however, that it can be said that all investigators do now agree that it is a secondary

condition, and that it may be caused by any one of several different organisms. The ones which are most commonly blamed and most frequently found in this disease are *Bacterium suispestifer*, *Bacterium coli* and *Bacterium paratyphosum B*.

Experiments reported by Dorset, at the last meeting of the United States Live Stock Sanitary Association, show that *Bacterium suispestifer* is a very active organism in this necrotic enteritis, and that swine that were immune to cholera are less liable to be affected with this condition than are susceptible swine. His investigations have not been completed. They are, however, in line with those of many others, since it has been shown by others that swine which are devitalized by any condition, such as a primary infection of the lungs, or by intestinal parasites, are extremely liable to have necrotic enteritis.

Personally I believe that *Balantidium coli*, or the plain round worm, is more frequently responsible for necrotic enteritis than any other condition, unless it be a primary infection of the lungs caused by *Pasteurella suisseptica*. There is one other rather characteristic point about necrotic enteritis, and that is that it is generally a filth-born disease; it is not often seen in sanitary pig lots. When paddocks, fields, or pens are used continually, over a period of years, for raising swine, diseases of swine other than cholera become prevalent and this is particularly true of hemorrhagic septicemia and necrotic enteritis. The organisms which are supposed to be the cause of this condition find a very favorable habitat in insanitary hog wallows, in poorly kept barns, sheds or paddocks, and on soil which has been used for raising swine for many generations. I believe that the most efficacious treatment or rather the most efficacious prophylaxis is sanitation. If barnyards and paddocks were kept clean and hogs were not allowed to have access to these insanitary conditions, there probably would be very much less necrotic enteritis.

There is one great danger, I believe, connected with the diagnosis of necrotic enteritis as such, and that is that we may overlook another condition. The lesions of necrotic enteritis are frequently found in swine affected with cholera. Such lesions are not caused by the filterable virus of cholera, but by the bacteria mentioned.

Now, inasmuch as we find these lesions so frequently in both conditions, we might very easily overlook hog cholera which is combined with intestinal lesions, and unless one can be sure that

the filterable virus of hog cholera is absent, he should beware of diagnosing necrotic enteritis.

We have some specimens here this morning that Dr. Joss has been good enough to procure for us, and I have just been wondering whether we are going to have a demonstration of necrotic enteritis or ascariasis. It looks to me as though we might get both. I think we all recognize in these cases symptoms which are ordinarily thought of as necrotic enteritis. At the same time these small pigs are just about the right size for pulmonary ascariasis. They are showing the symptoms which generally follow a prolonged affection with that parasite, and so I would suggest that in all cases of this kind we be on our guard particularly for ascariasis when we think we are dealing with necrotic enteritis, because naturally any treatment or any preventive measure which we might carry out for necrotic enteritis other than sanitation would have no effect whatever on ascariasis.

We have spoken of the various things which may cause necrotic enteritis, the various supposed etiological factors, and I feel that we need to say little about the symptoms, other than the progressive emaciation and loss of flesh. This condition is generally spoken of as a drying-up disease, and as we see here, it is very well named.

The pathological changes are confined almost entirely to the intestinal mucosa. We have first considerable congestion of the mucosa, accompanied by congestion and infiltration of the mesenteric glands. Some animals may die before the infection progresses beyond that stage. This is particularly true when *Bacterium paratyphosum B.* is the etiological factor. Ordinarily however, in herds where old wallows or other insanitary conditions are present, the primary stage is completely missed. The owner is not the best observer in the world and he fails to observe the primary symptoms which might be observed by one who is more acute.

Therefore, the first symptom which is observed, as I say, is the gradual emaciation, and an autopsy at that time indicates that the infection has progressed beyond the stage of congestion of the mucosa. Our next pathological change is a thickening of the intestinal mucosa and the musculature. Usually the entire intestinal tract is very badly swollen, which may even progress to a point that the lumen is almost closed. This very rapidly progresses, then, to necrosis and we get first a small localized, somewhat irregular patch of necrotic material. It is somewhat cheesy, tending to be deep-seated, very much the same as or-

dinary necrosis, which gradually tends to become confluent until large areas of the intestines are involved.

This gradually assumes a drying-up condition, until the entire intestinal mucosa may have the appearance of leather, being very thick, very dry and tough. Naturally while this condition is progressing emaciation is marked, inasmuch as the pathological changes which have been so briefly described make it almost impossible for the system to assimilate the food which is ingested.

Now, if Dr. Schwarze is ready, I believe possibly our best chance of continuing the subject would be to autopsy some of these cases.

This animal died before it could be destroyed and I presume will make a very good specimen. I know nothing whatever of the history of these cases, but we ordinarily find a chronic lung infection in conjunction with the intestinal infection. In this case we have to guess whether or not this primary lung infection was present because we do not know what the symptoms were. From experience I would rather expect to find such a chronic focus in the lungs. The glands are practically normal; there is a slight infiltration, but nothing of any importance.

The average case of necrotic enteritis is not difficult of diagnosis. It is simplicity itself, compared with the diagnosis of hog cholera and hemorrhagic septicemia, because the pathological changes are so marked, so different from those observed in other diseases that there is little difficulty in diagnosis. It seems to me the most important thing connected with this disease in so far as diagnosis is concerned, is to realize that we have conditions here which are so frequently associated with cases of hog cholera which have been of long standing, and that these lesions are not the lesions of cholera, and should they be observed as post-vaccination trouble, every effort should be made to determine whether the chronicity indicates an infection previous to immunization. As a rule there are no petechiae in the kidneys.

CHAIRMAN KINGMAN: Mr. Plaisance wishes to show you the pigeon that was before us yesterday.

MR. PLAISANCE: This is the pigeon that was paralyzed yesterday and that we treated with the vitamin product. He has had it a little difficult, because he has been in a wet cage and these birds have a subnormal temperature with this paralysis. That being the case, of course, with a subnormal temperature and a wet condition, he is not quite as pert as he should be. He is not quite as pert as I would expect him to be this morning,

but you will notice the difference between this pigeon today and the condition it was in yesterday. You will notice he can walk today; yesterday he was unable to do that. (Applause).

Yesterday you remember he was paralyzed and his head was drawn back. That just shows you the effect of water-soluble B vitamin in correcting the deficiency disease known as polyneuritis, or the disease affecting the nerves through the deficient diet. I thank you. (Applause)

DR. CAHILL: The lungs are in very bad shape and will be discussed better by the next speaker. We have every evidence here of a long-standing and primary infection by some other organism, possibly *Pasteurella suisepitica*, and you will observe around the ileo-cecal valve there are several button-ulcers. It is difficult, of course, to say how old these ulcers are but undoubtedly they are less chronic than the infection of the lung. Apparently this animal suffered more from its lung condition than from necrotic enteritis.

CHAIRMAN KINGMAN: While they are working on this autopsy, we will give you the opportunity to ask Dr. Joss the questions that you had in mind, since his time was cut short.

DR. TREMAN: I would like to ask the doctor to differentiate a little bit in post-mortem lesions between cholera and hemorrhagic septicemia.

DR. JOSS: I believe that is a pretty difficult question to answer, doctor. In answering that question I would prefer to know some of the ante-mortem symptoms and then associate those with the post-mortem findings. Then you might be in a position to judge more correctly. I believe it is a pretty hard matter to differentiate between those two diseases. I would think you would have, in your swine, hemorrhagic septicemia more of a pulmonary disturbance than you do in hog cholera.

DR. TREMAN: Is there any difference in the appearance of the glands, do you think?

DR. JOSS: Well, I believe that the bronchial glands, especially, are much more enlarged than they are in cholera, more highly inflamed. In those cases that I have seen, that they called hemorrhagic septicemia, they were as large as a hen's egg and very highly inflamed. I believe also that in the case of hemorrhagic septicemia the onset of the disease is very sudden, with a large number of animals affected with the characteristic flanky breathing, accompanied with violent coughing.

DR. TREMAN: Oftentimes we find the glands are black and

infiltrated all the way through; other times just petechiated. Is there anything characteristic about either one of these conditions?

DR. JOSS: In this connection, I would say no.

DR. TREMAN: My idea was to try and learn something, some way of differentiating the lesions, if there is any.

DR. JOSS: My personal opinion is that you will find as much diarrhea in hemorrhagic septicemia, especially of the intestinal type, as you do in hog cholera.

DR. EMERY: I was just saying what we do at the post-mortem of hogs in transit. When we find a hog with the tissues absolutely or apparently normal and showing no indications of chronic diseases, we are likely to be more suspicious of hemorrhagic septicemia than we are of cholera. Of course, that is where we have no knowledge of the ante-mortem symptoms.

DR. CAHILL: The specimens of the second pig are being passed around. I think every one who sees them will be impressed by their negative character. It is one of those autopsies that are held so often on these chronic, emaciated pigs, in which the veterinarian is sure that he is going to find chronic intestinal lesions and then fails to do so. I think you have all had that experience. It is quite a common one.

You will notice particularly that the lungs are comparatively free from chronic pathological changes with the exception of the apical lobe. I would rather be inclined to think, from talking to Dr. Ransom, that in this particular case we probably had a primary devitalizing condition of pulmonary ascariasis. This slight edematous condition, without having well marked edema, is quite typical of a pulmonary type of ascariasis, and with the lesions which we have here. The thickening of the intestines and the diphtheritic exudate around the ileo-cecal valve, indicate that if this pig had been allowed to live he would have undoubtedly developed necrotic enteritis.

QUESTION: What is your diagnosis on the first?

DR. CAHILL: Probably hemorrhagic septicemia.

We have here pretty much the same condition that we had in the first pig, a primary infection in the lungs.

Here we have that lung filled with serous exudate. Here again we haven't any well marked necrotic enteritis. It seems to me that these three cases serve very well to illustrate the contention that necrotic enteritis is always secondary, and that we start with some other infection or some other localized condition

—ascariasis or some pulmonary infection, such as hemorrhagic septicemia.

I think that needs to be taken into consideration in our diagnosis and prognosis, because finding pigs with practically no intestinal lesion doesn't preclude this extremely bad lung.

CHAIRMAN KINGMAN: Dr. Cahill will take a few minutes to answer some questions on necrotic enteritis.

DR. CAHILL: Before I answer any questions I want to say that Dr. Schwarze has dug out a good specimen for us, and that will be passed around. I haven't seen the lungs of this pig but evidently we will find the same conditions.

Here we have a good specimen of necrotic enteritis, except this has not gone on to the intense, dried-up, leathery mucosa that would come later. This has a blackened appearance and looks as though the pig has had a depraved appetite, which is associated with the primary stages of this disease.

QUESTION: Do those cases have high temperatures?

DR. CAHILL: As a rule, no. But in the primary stage, when the animal is first combating infection from the organisms which are normally present in the intestinal tract, and which are enabled to cause pathological changes on account of previous devitalization, we do have a rise in temperature. With a pig having lungs like the first one, we would have a rise in temperature, but in typical necrotic enteritis we rarely find it.

QUESTION: In unvaccinated hogs in which you find necrotic enteritis and evidence of hog cholera, do you recommend serum-virus treatment?

DR. CAHILL: It all depends on the local conditions, doctor. If I do, I want to advise the owner to expect a heavy loss, because you will sure get it when you put virus into that kind of a pig. Serum-alone treatment should be given.

CHAIRMAN KINGMAN: Dr. Schwarze will take up the subject of hemorrhagic septicemia in swine. (Applause).

DR. SCHWARZE: Gentlemen, we have some pigs here that have symptoms somewhat different than we usually find in the ordinary case of hog cholera. Of course, we will have to take into consideration, probably, strictly hog cholera or strictly symptoms of this particular disease.

It will be noticed that the appearance is that of an infection of the thoracic cavity, rather than a general devitalized condition, which you notice in hog cholera, and you will also observe that

you usually have constipation in this condition, where otherwise you might possibly have a diarrhea.

Here are a couple of pigs that are quite typical of the condition. It seems that when pigs of this kind are vaccinated, the response is very poor. It does not make much difference how much serum you give them, or how little virus you give them, the results seem to be about the same. The mortality in them is not as large as it is in a cholera hog. However, if the surroundings are not favorable, the mortality may be quite heavy.

(I wish you would drive those pigs out here a little further so we can get a better view of them.)

Now, by taking blood from a pig like that and injecting it into cholera-susceptible pigs, you will not produce a disease of any kind, which seems to show that there is no hog cholera virus present, or that this infection is not in the blood. However, I think there is a period when the infection does get into the blood and that is probably during the agonal stage or shortly before death. I think there is a possibility that often the infection gets away from the thoracic cavity through the circulation.

As to lesions, it is a hard thing to say. We sometimes find lesions that are quite typical of hog cholera. At the same time, as I say, blood can be injected into an animal and you cannot reproduce the disease. On the other hand, we find a practically lesionless condition. The temperature is very erratic in these cases. Sometimes it runs up to 107 and 109, and maybe higher. In other cases there may be a subnormal temperature; however, I do believe that at one period of this disease there was a high temperature and that this lowering of the temperature is probably a reaction from these severe attacks.

Take the lungs, for instance. You would think that they may be completely consolidated. Sometimes they breathe with difficulty, while at the same time when you hold a post-mortem you will find, not a true pneumonia, but rather an edema of the lungs and perhaps pneumonic or consolidated areas throughout the different portions of the organ, especially the apices of the lungs.

The blood usually has a very dark color which seems to show that oxidation did not take place properly, and instead of coagulating, like ordinary blood, it will gel and is difficult to defibrinate.

QUESTION: Are these natural cases?

DR. SCHWARZE: Yes. These are natural infections, and the

thing that I should say and impress upon your minds is that this disease does not seem to be very fatal, contagious or infectious under certain circumstances.

I hardly know how to define it from that standpoint. It seems that the germ is harbored in these animals and as long as everything goes along alright, and they are kept under a normal condition, and their resistance not lowered, through some external or unknown cause, they will not develop it. However, it seems that any one of the many causes that may lower the resistance of these animals will have a great tendency to predispose them to this disease and they will develop it.

We will kill one of those pigs and see what particular lesions they will show.

QUESTION: Have they been vaccinated?

DR. SCHWARZE: These pigs have been vaccinated. That, however, does not make any difference, if the vaccination period has gone beyond the time of the incubation stage of hog cholera. We get a great many so-called "breaks," thirty, sixty, ninety, and one hundred and twenty days after vaccination. In those cases you would not be very likely to demonstrate any hog cholera virus, while on the other hand, if an animal would get a complication of this condition following vaccination, inside of thirty or thirty-five days, you would be almost sure to demonstrate hog cholera virus, for the simple reason that it was injected there in the first place, and not because this disease is complicated with hog cholera. It can be a disease that occurs specifically in itself. It may occur in combination with hog cholera, or you might say, *vice versa*, hog cholera may be complicated with this particular disease.

QUESTION: How long have these hogs been sick?

DR. SCHWARZE: About twenty-four hours.

QUESTION: Could you produce this disease by experimental inoculation?

DR. SCHWARZE: I believe you can. I would not want to say anything very definite on that, but I believe you can.

Gentlemen, I remember one case in particular where a bunch of hogs were dying; about thirty-five percent of this herd died. It was a herd that had been vaccinated probably sixty to ninety days, previously, and some of them probably a year or two. We isolated the bipolar organisms out of these cases, and were able to demonstrate the condition typically by artificial inoculations. This particular organism, at that time in a pure culture, gave the

appearance of a coccus, rather than a bipolar organism, and we worked with it for several months, trying to satisfy ourselves whether it was a coccus or a bipolar organism that was causing this condition.

In the pure culture we would always demonstrate the coccus form, in fact a person was not safe in calling it anything else but a coccus unless he knew differently. However, when we would inject that culture in small laboratory animals, and would make smears of the blood of these animals, we would get the typical bipolar every time. So we finally concluded it was without a question the bipolar organism we were dealing with.

QUESTION: Are mature hogs very often affected with this condition?

DR. SCHWARZE: Not so much so. It seems the age of the hog has a great influence as to its susceptibility. However, they are not immune by any means. I have seen whole herds of one-hundred-and-fifty or two-hundred-pound hogs become affected with this condition.

QUESTION: Can you make any differentiation between this and what has been described as hog "flu"?

DR. SCHWARZE: No, I can not. As far as the name of the disease is concerned, that is an open question. I do not care what it is called, as long as we recognize we have something else besides hog cholera. It is giving us a whole lot of trouble and that is of more interest to me than anything else.

CHAIRMAN KINGMAN: While these lesions are being prepared, we will listen to a few words from Dr. Eichhorn, regarding swine erysipelas. Dr. Eichhorn. (Applause).

(To be continued)

TOO LATE

A negro was trying to saddle a fractious mule, when a bystander asked, "Does that mule ever kick you, Sam?"

"No, suh, but he sometimes kicks where I'se jes' been."—*Boy's Life*.

WHEN BILL WAS FRANK

Registrar (to freshman): "What is your name?"

Freshman: "Jule, sir."

Registrar: "You should say Julius." (To next boy): "What is your name?"

Second Boy: "Billious, sir."—*'Ee-'Aw*.

OTHER MEETINGS

PENNSYLVANIA STATE VETERINARY MEDICAL ASSOCIATION

The fortieth annual meeting of the Pennsylvania State Veterinary Medical Association was held this year, as it has been for the past few years, in conjunction with the annual meetings of all Allied Agricultural Associations of the State of Pennsylvania. Agricultural Week this year brought together the following organizations:

Pennsylvania State Veterinary Medical Association
Pennsylvania Breeders' and Dairymen's Association
Pennsylvania Holstein-Friesian Association
Pennsylvania State Poultry Association
Pennsylvania Sheep Breeders' and Wool Growers' Association
Society of Farm Women of Pennsylvania
Pennsylvania Threshermen and Farmers' Protective Association
Market Masters of Pennsylvania
Marketing Conference
Pennsylvania Tobacco Growers' Association
Pennsylvania State Beekeepers' Association
Pennsylvania Potato Growers' Association
State Horticultural Association of Pennsylvania
Pennsylvania Farmers' Cooperative Federation
Pennsylvania Department of Public Instruction

The great advantage of having the veterinarians of the state meet with the other Allied Agricultural Associations is apparent at once. After several years' trial the only objections that have been raised, by the members of our Association, are the great congestion of hotels, restaurants, etc., when all of the organizations meet at one time, and the fact that arrangements of this sort make it impossible to have our Association visit various sections of the State. Both of these objections can be overcome by holding our meeting with other associations the year that the legislature is not in session, and "legislature years" go to other sections of the state.

The plan of last year was followed with reference to our program. All twelve of the veterinary clubs, which have been

organized throughout the State of Pennsylvania, were invited to select a member to represent each club on the State Association program. As the veterinary clubs are made up largely of practising veterinarians, this plan insures a liberal number of good practical papers by practitioners.

In addition to the papers presented by the representatives of the veterinary clubs, Dr. C. J. Marshall, Professor of Veterinary Medicine, of the School of Veterinary Medicine, University of Pennsylvania, presented a paper "Fat Necrosis in Cows and its Relation to the Diagnosis and Treatment of Sterility."

Dr. Adolph Eichhorn presented a paper on "Swine Disease." Dr. Wm. J. Lentz, of the Veterinary School, University of Pennsylvania, read a paper on "Obstetrics in Small Animals." Dr. E. L. Stubbs, of the Pennsylvania B. A. I., presented a paper on "Poultry Problems." Major A. L. Mason, V. C., U. S. A., presented a most interesting paper relative to the "Veterinary Officers' Reserves Corps of the U. S. Army." Drs. John Reichel and J. E. Schneider presented a paper on "Canine Rabies Vaccine."

Dr. W. S. Gimper, of the Pennsylvania B. A. I., read a very interesting paper on "Pennsylvania's Meat Inspection Service," quoting authorities to show meat inspection was given serious consideration in Pennsylvania even during the colonial days.

Many of these papers have already been published in the JOURNAL of the American Veterinary Medical Association and additional papers will be submitted for publication in the near future.

The meeting was very well attended and the entire membership took an active part in the discussion of all papers presented. There was a air of optimism about the practitioners present. It was felt that the profession had seen its darkest days and that with better live stock prices prevailing, a greater demand for good horses and a larger share in tuberculosis eradication work, the future looked brighter than it had at any time during the past three or four years.

The election of officers resulted as follows:

President, Dr. N. H. Allis, of Wyalusing; Vice-Presidents, Dr. S. G. Hendren, of Lewistown, and Dr. Thomas James, of Scranton; Recording Secretary, Dr. C. S. Rockwell, of Philadelphia; Corresponding Secretary, Dr. R. M. Staley, of Philadelphia; Treasurer, Dr. Thomas Kelly, of Philadelphia.

VIRGINIA STATE VETERINARY MEDICAL ASSOCIATION

The annual meeting of the Virginia State Veterinary Medical Association was held on January 11-12, 1923 in the parlors at Murphy's Hotel, Richmond, Va. There were forty of the practitioners of the State present at the roll-call. The meeting was opened by an address by the President, Dr. H. S. Willis. The doctor urged the need of closer cooperation between the members of the Association.

The State Veterinarian, Dr. J. G. Ferneyhough, read an address on "Why the State Veterinary Department Does not Recognize the Retest of Reactors." This brought out a good deal of discussion, which resulted in the passage of a resolution to the effect that the Association fully endorsed the sentiments expressed in the address.

Dr. W. L. Thompson, of Suffolk, Va., read a paper on "Botulism in Horses." This was followed by a very spirited discussion, particularly regarding the use of serum in treatment and prevention.

The election of officers for the next year resulted as follows: Dr. E. J. Willis, Harrisonburg, Va., President; Dr. R. M. Graves, Culpepper, Va., First Vice-President; Dr. W. A. Robins, Danville, Va., Second Vice-President; Dr. Geo. C. Faville, Hampton, Va., Secretary-Treasurer.

The next meeting will be held at Ocean View, Va., July 12-13, 1923. An interesting program is being arranged and a good meeting is assured.

Geo. C. Faville, *Secretary*.

VETERINARY MEDICAL ASSOCIATION OF NEW YORK CITY

The regular monthly meeting of the Veterinary Medical Association of New York City was called to order by the President, Dr. J. Elliott Crawford, in the Academy of Medicine, 17 West 43rd St., Wednesday evening, March 7th, at 8:45 p.m.

The minutes of the February meeting were read and approved.

Dr. J. G. Wills, of Albany, N. Y., gave a very interesting talk on the control and prevention of rabies, as conducted by the State Department. He stated that this disease was not very prevalent in the northern one-third of the State, and that this was due to the distance from large cities and to the less populated

areas, but he was of the opinion that in the future, owing to the advent of the automobile, it may become more prevalent in that end of the State.

He explained the losses among sheep, due to stray dogs. A number of cattle have died, due to having been bitten by rabid dogs. Vaccination of all animals in outbreaks has not yet been considered definitely, but might be of value during a quarantine. The difficulty in maintaining quarantine regulations and muzzle ordinances in the various communities was due to the inability to secure competent men to do the work. The muzzling and licensing laws were due to the sheep industry, and rabies outbreaks were usually due to stray dogs. It was the speaker's belief that by immunizing all dogs, an immune race might be developed.

Dr. Wills spoke of his work at the present time of supervising the animal industry of the various state institutions, numbering 42, divided into the charitable, prisons and reformatories, with a combined population of inmates and help of about 100,000 persons. These institutions conduct 30 farms, of from a few acres to one of 13,000, at Clinton prison. On these farms are conducted 26 dairies, of from 5 to 250 cows. A total of about 3,000 cattle, 5000 to 10,000 hogs, 30,000 poultry and between 400 and 500 horses are maintained on these farms.

Of the 26 dairy herds, six are placed on the accredited list and nine have passed two tests. The per-cow production of some of the herds was one-third higher than the average, due to constantly adding fresh cows. The hogs on these farms are practically free from hog cholera. The farm products from these farms consist principally of hay and garden products.

Dr. Geo. J. Goubeaud reported some cases of dogs being bitten by a rabid animal, and among these were eight dogs vaccinated one year ago, all being well at this time. Dr. W. C. Miller stated that the Department of Health was in sympathy with some feasible plan for vaccinating all dogs, but spoke of the difficulty of controlling the dogs belonging to irresponsible people. Dr. J. Payne Lowe spoke of an outbreak of rabies around Nutley, N. J., and had vaccinated a number of dogs exposed. The rabies question was further discussed by Drs. Miller, Little, Chase and others.

Dr. Ray W. Gannett gave a good report of the Conference of Veterinarians held at Ithaca, Jan. 11th and 12th. Dr. C. S. Chase also discussed the various papers presented at Ithaca.

Drs. W. C. Miller and Henry Amling were elected to membership in the Association.

No further business appearing, the meeting adjourned.

April Meeting, 1923

The regular monthly meeting of the Veterinary Medical Association of New York City was called to order by the President, Dr. J. Elliott Crawford, in the Academy of Medicine, 17 West 43rd St., New York City, April 4th, at 8:45 p.m.

The minutes of the March meeting were read and approved.

Dr. Chas. V. Noback related some of his experiences while in Colombia, South America. Owing to the high altitudes and the lowlands, a number of peculiar or strange symptoms appear among the animals. He found the lowlands, owing to the moisture, fertile soil and continued moderate temperature, to be fertile fields for the growth of bacteria and epidemics of various diseases would soon reappear, after they were thought to be under control.

He found but few veterinarians in the country and most of the work is being done by trained laymen. A number of vaccines and serums are used, but it will require a large force of trained veterinarians and bacteriologists to organize the veterinary control work properly in that country.

Dr. Adolph Eichhorn addressed the meeting on the "Activities of the Veterinarian in Comparative Medicine." The doctor advised and encouraged a liberal campaign of advertising, as the need of the veterinary profession, and that we must impress the medical profession of our importance in the protection of human life. He spoke of a number of contagious diseases at length, and brought out many important points in their control, all of which will be published in the Journal of the A. V. M. A.

Dr. Slawson reported having seen a case of actinomycosis in a girl, in New Jersey. Dr. E. B. Ackerman reported having seen 16 cases of glanders in the human, while in the Department of Health.

Dr. C. S. Chase spoke of the inefficient inspection of food and milk products in the rural districts and that such inspection should be controlled entirely by the veterinarian.

Dr. Alex Slawson suggested that we report, in the local papers, the various papers read in this Association.

On motion a rising vote of thanks was extended Drs. Noback and Eichhorn for their splendid addresses.

No further business appearing, the meeting adjourned.

C. G. ROHRER, *Secretary*.

B. A. I. VETERINARY INSPECTORS' ASSOCIATION OF CHICAGO

The following is a report of the meetings held during the past month by the school of instructions for veterinary inspectors which meet in the Government Office of one of the local plants each Monday morning. The Chicago Branch of the National Association of Bureau of Animal Industry Veterinarians prepares a program for several weeks in advance on various subjects relating to meat inspection. Pathological specimens of interest, as well as rare conditions found by the inspectors are collected during the week and presented to the meetings for diagnosis and discussion.

On April 16, 1923, Dr. A. A. Swaim gave a very interesting and instructive talk on "Diseases, Diagnosis and Dispositions, in Accordance with B. A. I. Regulations."

On April 23rd and 30th, talks were given by Dr. L. T. Hopkins, who discussed "The Lymphatic System and Its Importance to Post-mortem Inspection." All of the important lymphatic glands were illustrated on large charts, showing the afferent and efferent vessels.

L. T. HOPKINS, *Secretary.*

VETERINARY MEDICAL ASSOCIATION, FIRST DISTRICT OF OHIO

The Veterinary Medical Association of the first district of Ohio held its spring meeting, at London, Ohio, on Thursday, April 19th. The meeting was well attended by the men of Union, Madison, Clark, Logan and Champaign Counties, which counties constitute the district. The Association has been in existence nine months and has held three meetings.

Drs. Dingman and Hunt, of London, arranged for a mighty fine luncheon at the Neil House, which was very much enjoyed by all the boys present. The meeting proper was held in the Directors Room of the Exchange Bank. The program consisted of the following papers; "Swine Parasitism," by Dr. Stockwell, of Mechanicsburg; "Surgery in Swine," by Dr. Kettler, of Milford Center; "Post-vaccination Problems," by Dr. Shaw, of St. Paris; and "The Necessity of a Veterinary Practice Act," by Dr. F. A. Lambert. The papers were fine and were thoroughly discussed.

Dr. Fred A. Zimmer, newly appointed State Veterinarian, was present and outlined the policies of the State Veterinarian's

office. He solicited the cooperation of practicing veterinarians. Dr. Zimmer's talk was very much appreciated by the Association and the policies outlined were heartily endorsed.

All in all this meeting was the best the members have attended for some time. The Association adjourned to meet at Russels Point, Ohio, in August, with the Northwestern Ohio Veterinary Medical Association.

P. T. ENGARD, *President.*

NATIONAL ASSOCIATION OF B. A. I. VETERINARIANS, METROPOLITAN DIVISION

A meeting of the Metropolitan Division, N. A. B. A. I. V., was held at the Laboratory, U. S. Barge Office, New York, N. Y., at 8 o'clock, p. m., May 4, 1923. Thirty-four members were present, Dr. Albert Long, President, presided.

Through the courtesy of the Chief, Bureau of Animal Industry, Dr. U. G. Houck, Chief, Division of Hog Cholera Control, was present and delivered an address in which he outlined the history and various activities of the Bureau. He made particular reference to the valuable farm experimental and demonstration work carried on by the Bureau in the various states, either alone or in cooperation with the State Experimental Stations. A vote of thanks was extended to Dr. Houck for his instructive and interesting address. Also, the Secretary was instructed to write to the Chief of the Bureau, thanking him for his courtesy.

Previous to the address by Dr. Houck, a business session was held.

Dr. R. M. Mullings, Chairman of the Legislative and Publicity Committee, reported by letter a recommendation of the Committee that the Division have an open meeting to which the public and representatives of the press be invited, this meeting to be addressed by some person designated by the Bureau who will give the public an outline of the Bureau's activities, followed by several reels of motion pictures portraying the actual work of the Bureau.

A letter was received from Dr. E. H. Baumann, Albany, N. Y., resigning from our Division on account of his joining a new Division organized in his District, known as the "Northeastern States Division." Resignation accepted.

A motion was made and carried that the Division be represented by a delegate at the next National Convention.

Election of officers:—Dr. J. Huelsen, president; Dr. C. R. Biederman, vice-president; Dr. E. L. Sander, secretary-treasurer.
E. L. SANDER, *Secretary-Treasurer*.

NATIONAL ASSOCIATION OF B. A. I. VETERINARIANS, MICHIGAN DIVISION

The annual meeting of the Michigan Division of the National Association of Bureau of Animal Industry Veterinarians was held in Room 408, Post Office Building, Detroit, Mich., Friday evening, May 4, 1923. Following the election of officers and routine business, the members repaired to the Fort Shelby Hotel and enjoyed an evening at the banquet table, where, in addition to good things to eat, a musical and intellectual treat was given.

The musical program was furnished by Dr. Chas. F. Davis, of the Detroit force, and Mesdames Dunn and Collings, the latter being a daughter of our local President Dr. E. P. Schaffter.

Following this program, the toastmaster, Dr. Schaffter, introduced the following speakers: Dr. H. Preston Hoskins, Secretary-Editor of the A. V. M. A. who spoke on "The Value of Organization." Dr. Hoskins scored many lasting impressions with his subject. Dr. B. J. Killham, State Veterinarian, told us of the work of the State Agricultural Department and the methods used in handling various animal diseases in Michigan, inimical state laws and bills proposed, which could be coped with successfully only through organization.

Dr. S. Brenton, ex-President of the A. V. M. A., gave an instructive, helpful and much appreciated talk on the veterinary profession. Dr. R. A. Runnells, Assistant Pathologist, Veterinary Department, Michigan Agricultural College, and Secretary of the State Association, gave an address that was interesting and instructive.

Dr. Henry V. Smith, of the Detroit B. A. I. force, talked on "Imports and Exports in Connection with the Bureau of Animal Industry, at the Detroit Station." Dr. Smith, whose duties cover meat export and import, and animal export and import, displayed a high degree of familiarity with this work and handled his subject in a forceful manner.

The members of the Committee on Arrangements are to be congratulated for their splendid work and program. Dr. M. A. Ruck, of Detroit, was elected local President for the ensuing year and J. W. Vance, Secretary-Treasurer.

J. W. VANCE, *Secretary-Treasurer*.

THE CONESTOGA VETERINARY CLUB

The Conestoga Veterinary Club held its annual Shad Dinner at the Stock Yards Inn, Lancaster, Pa., on May 10th, with twenty-nine members in attendance. Drs. C. J. Marshall, W. J. Lentz, G. A. Dick, F. A. Marshall, T. E. Munce, H. R. Church and S. E. Bruner attended, as guests of the Club. There was much enthusiasm displayed and the occasion was enjoyed by all.

NATIONAL CONVENTION OF ALPHA PSI FRATERNITY

The sixth National Convention of the Alpha Psi Fraternity convened at the Alpha Chapter House, Columbus, Ohio, May 18, 1923. Vice President John I. Handley, of Atlanta, Ga., presided. The following delegates were in attendance: F. G. Loomis, Alpha (Ohio State University); C. N. Bramer, Beta, (Cornell University); J. H. Spence, Epsilon (University of Pennsylvania); Scott A. Burnam, Zeta (Colorado Agricultural College); H. W. Graves, Theta (Alabama Polytechnic Institute). Iota and Kappa Chapters were unable to send delegates.

Besides the usual routine business transacted, one of the important decisions arrived at was to resume publication of the Alpha Psi Quarterly, and to publish the proceedings of this convention in the first issue, which will make its appearance about September 1st. It was decided to hold the next convention in 1925, as the guests of Zeta Chapter, either at Fort Collins or Estes Park, Colo.

National officers were elected as follows:

President: Dr. John I. Handley (Theta), of Atlanta, Ga., for four years.

First Vice-Pres.: Dr. R. E. Rebrassier (Alpha), of Columbus, Ohio, for two years.

Second Vice-Pres.: Dr. B. Scott Fritz (Epsilon), of Philadelphia, Pa., for two years.

Secretary: Dr. H. Preston Hoskins (Epsilon), of Detroit, Mich., for four years.

Treasurer: Dr. M. C. Linnemann (Gamma), of St. Joseph, Minn., for two years.

The entire first day of the convention was consumed with business sessions, which did not come to a close until 8:00 P. M. The second day was given over to a very fine social program which had been arranged by the members of Alpha Chapter.

COMMUNICATION

HOG CHOLERA LEGISLATION IN MICHIGAN

TO THE EDITOR:—

Michigan veterinarians and several of the leading swine breeders, assisted by some of the most prominent county agricultural agents, succeeded in defeating a bill to amend the live-stock sanitary laws of the State, so that after meeting certain requirements the laity could immunize hogs against cholera. The bill was patterned after the Iowa law and called for the conducting of schools to instruct farmers to vaccinate their own hogs. The bill also was intended to regulate the sale and use of biologics by veterinarians. As originally introduced, the bill made it unlawful for a veterinarian to make a profit on serum, but this was finally amended to permit him to make a profit of 15 percent. The penalty for violation of this section of the act was to be revocation of the veterinarian's license for a period of one year.

The bill was introduced in the House of Representatives and referred to the House Agricultural Committee. The Michigan State Veterinary Medical Association, the State Department of Agriculture, the American Veterinary Medical Association and the Veterinary Division of the Agricultural College had representatives at a hearing before this committee. In addition to these bodies, five leading and aggressive county agricultural agents and a few swine-breeders were present to oppose the bill. The proponents of the bill were represented by six or eight hog-raisers of Lenawee County, together with their county agricultural agent, who sponsored the bill.

The House Agricultural Committee reported the bill out favorably, with an amendment permitting veterinarians to make a profit of 15% on serum. When it came up on general orders, further amendments were tacked on, and when it came up for final reading still another was added, which limited the conducting of schools to counties in which at least five reported and verified outbreaks of cholera had occurred within a period of six months prior to the conducting of such a school. After considerable debate the bill lost by a vote of 47 to 39.

The opposition in the House was led by Rep. J. P. Espie, of Eagle, Michigan, and it is hoped by officers of the State Association that many of the veterinarians of Michigan will write Mr. Espie a letter, letting him know that his efforts in opposing this pernicious piece of legislation are highly appreciated.

R. A. RUNNELLS, *Secretary.*

East Lansing, Mich., May 14, 1923. Mich. State Vet. Med. Ass'n.

MISCELLANEOUS

VETERINARY WORK IN INDIA

Last year an advisory committee appointed to report on research in diseases of animals in India stated that there were immense opportunities, which were almost wholly neglected. A conference of veterinary authorities convened by the government, which met last February at Calcutta, confirmed the preceding statement and urged the training in courses of two or three years of native veterinarians of a second grade cadre, who might at least be competent to carry out instructions and perform routine work. The present financial stringency prevents the materializing of a recommendation of previous conferences to provide facilities for the training of natives up to the highest standards. Experience with the training of Indians in other branches of applied science, such as medicine, shows their capacity to grasp fully the results of modern science. But for this, an ample preliminary education and a full course of four years' professional work at a properly equipped college would be necessary.

The conference reviewed the state of knowledge and practice with regard to the chief animal diseases now ravaging India, and arrived at lamentable conclusions. Anthrax infection is so heavy in East Indian wool, hair and hides that the labor organization of the League of Nations drew attention to it. The cost of disinfecting wool is greater than its present value. The conference decided that the agencies for the notification of anthrax must be improved, and that much research and skilled inspection are required to attack the cause at its seat. Rinderpest still exacts a heavy toll from live stock in India, and although an efficient serum is produced in large quantities in the Muktesar Imperial Bacteriological Laboratory, the veterinary service is insufficient to distribute and administer this preventive measure. Surra disease of horses and camels is sometimes so disastrous as to interfere with military operations. It is known to be caused by a trypanosome and probably, like trypanosomiasis and nagana, is insect-borne. But entomologic and veterinary research is necessary to discover the bearer and, therefore, the means of dealing with the disease.

Though tuberculosis is supposed to be a rare disease of cattle in India, it is an increasing cause of death in industrial centers, and a large proportion of cases show symptoms which in Europe are associated with the bovine type. But there is at present neither knowledge as to the prevalence of the human and bovine type of bacillus, nor any organization for getting it. Contagious abortion of mares and cattle, and the large number of infections due to hookworm, rabies and other diseases await research on a much larger scale. The conclusion is that veterinary education, research, legislation and administration in India are unsatisfactory, and require the serious attention of the government.

(*Jour. A. M. A.*)

CONSIDER THE RABBIT'S FOOT

A. J. C. in HYGEIA

Among the illiterate, in certain parts of the country, there is a firm belief in the value of the rabbit's foot as a preventive or cure of disease and as a bringer of good luck. It must be the left hind foot of a rabbit that has been caught in a churchyard during the dark of the moon. Probably the number of people in the United States who believe in the efficacy of a rabbit's foot is small. But suppose that some one concern had an exclusive proprietary right to the sale of rabbits' feet and that the feet could be purchased only from this company; suppose, further, that the company carried on an extensive and intensive advertising campaign setting forth the marvelous therapeutic efficiency of the pedal extremities of *Lepus sylvaticus*; suppose that articles appeared here and there in the newspapers telling of the success that had attended the use of the rabbit's foot in the treatment of certain ailments; suppose that signed testimonials were published recording the alleged recoveries from various chronic ailments following the use of this marvelous curative agent. What then! It is by no means unthinkable that under such conditions many people of intelligence would be found ready to declare that the rabbit's foot has curative powers and that the physician who pooh-poohs the idea is actuated only by professional jealousy. Fortunately, there can be no monopoly on rabbits' feet. Any one can sell them. Therefore it does not pay to spend money on an advertising campaign extolling their curative value. And this, possibly, is the only reason that has prevented the humble cottontail from becoming a therapeutic hero.

VETERINARIANS ON PROGRAM OF WORLD'S DAIRY CONGRESS

Two University of Minnesota veterinarians have been honored by places on the program of the World's Dairy Congress. Their papers will be presented before a symposium on Important Diseases of Dairy Cattle. Dr. C. P. Fitch will read a paper on "The Present Status of our Knowledge of Abortion Disease," and "Sterility" will be presented by Dr. W. L. Boyd. The papers are to be printed in four languages. Delegates from every country in the world have been invited and are expected to attend this congress. Sessions will be held in Washington, D. C., and then the congress will adjourn to Syracuse, N. Y., in connection with the National Dairy Show.

ANOTHER COURT DECISION

The Supreme Court of Washington has upheld a lower court in rejecting the testimony of a physician in a case involving a charge of misrepresentation, with regard to certain cattle which had been subjected to the tuberculin test, a few days before their sale. The physician was not allowed to testify because he was not a veterinary surgeon, and, therefore, not qualified in veterinary science, and because he had never treated cattle or animals, and knew nothing about the effects of tuberculin on cattle or other animals. The Court held that while a general physician may have some knowledge as to the effect of tuberculin tests on either human beings or other animals, the witness in this case could not be said to have so qualified himself as to diseases of cattle and testing them for tuberculosis.

SOME CORN CROP

The teacher asked if there was anything worse than a giraffe with a sore throat?

"Yes, sir," came the answer from one boy.

"What, pray?" asked the teacher in surprise.

"A centipede with corns."—*Boot and Shoe World*.

AN EASY KEEPER

"What creature is satisfied with the least food?" asked the teacher.

"The moth," shouted the eager boy: "he doesn't eat anything but holes."—*Bulletin of Pharmacy*.

NECROLOGY

HENRY CAIRNCROSS LYON

Dr. H. C. Lyon, of Hutchinson, Minnesota, passed away Monday evening, April 30, 1923, at his home, after a brief illness. Dr. Lyon was born June 4, 1856 in the Province of Ontario, Canada, the son of Scotch parents. He came to the United States at the age of 24, settling at Grandin, North Dakota. He was married April 4, 1887 to Rebecca Pratt, of that city. He graduated from the Ontario Veterinary College, with the class of 1891. He immediately located in Hutchinson, Minnesota, and established a practice there. He remained in active practice until about fifteen years ago, when he accepted a position as Field Veterinarian, with the Minnesota State Live Stock Sanitary Board. About two weeks before his death, he was promoted by being elected Assistant Secretary of the Board. His work as a veterinary control officer took him into every corner of the state, and there was hardly a Minnesota veterinarian to whom Dr. Lyon had not endeared himself, so much so that he was called "Dad" by practically all of his colleagues in the profession.

Dr. Lyon joined the American Veterinary Medical Association in 1902. He was a member of the Minnesota State Veterinary Medical Association and served this body as President about two years ago. Dr. Lyon was a member of Temple Lodge No. 59, A. F. & A. M., with which he affiliated soon after locating in Minnesota; a member of St. Paul Consistory, 32nd degree Masons; and of Osman Temple, St. Paul, Nobles of the Mystic Shrine. He was also a member of the Order of the Eastern Star, and is said to have been the oldest member of that order, in point of years, in Hutchinson. Dr. Lyon is survived by his widow and one son, William, who is located in Los Angeles, California. For many years Dr. Lyon was in charge of the live stock sanitary work in connection with the Minnesota State Fair, and in this capacity he had come in contact with practically every prominent breeder in the Northwest. About fifty veterinarians were in attendance at the funeral.

We extend our sympathy to Dr. and Mrs. P. W. Horner, of Elkhart, Ind., in the loss of their only child, Dorothy Mary, aged 7 years, on April 3, 1923, from diphtheria.

Mrs. Harry J. Hoffeins, of Alta, Iowa, died March 19, 1923. She was born in Iowa Township, Crawford County, January 15, 1891, and was joined in marriage to Dr. Hoffeins June 10, 1914. Besides her husband she leaves two children, Adeline Rose and Harry Rae, her parents and one brother to mourn her loss. Mrs. Hoffeins was very active in church work in her community.

MARRIAGES

Dr. Ivan B. Boughton (Ohio '16), of Urbana, Ill., and Miss Juliette Bouin, of Bordeaux, France.

Dr. Denton H. Eastman (Ohio '22), of Galesburg, Ill., and Miss Tressa Sloan, of Greenville, Pa.

Dr. J. B. Hinds (K. S. A. C. '18), of Big Timber, Mont., and Miss Mary Agnes Holbrook, of Billings, Mont.

Dr. Isaac Gatz (K. S. A. C. '21), of Inman, Kan., and Miss Dorothy Ellis, of Pratt, Kan., December 28, 1922.

Dr. Raymond E. Harvey of Bonesteel, S. Dak., and Miss Verena Marguerite Boneberger, of Butte, Nebr.

Lt. J. W. Worthington (K. S. A. C. '17), of El Reno, Okla., and Miss Bernice Iva Loomis, December 17, 1922.

Dr. Edward J. Jelden (K. S. A. C. '22), of Whitewater, Kan., and Miss Vera Gates, of Pawnee, Okla., December 24, 1922.

Dr. Frank Charles Gearhart (Iowa '07), of Manila, P. I., and Mrs. Grace Thurber McKibbin, of Philadelphia, Pa., March 5, 1923.

Dr. John Sturrock (Conn. '20), of Attica, N. Y., and Miss Mary Medlock, of Interlaken, N. Y., May 22, 1922. (Announced April 23, 1923).

BIRTHS

Dr. and Mrs. E. A. Gilmore, of Effingham, Kan., a son, January 29, 1923.

Dr. and Mrs. White, of Riverside, Iowa, a daughter, Lourine Betty, April 4, 1923.

Dr. and Mrs. Clifford Gallagher, of Manhattan, Kan., a son, February 2, 1923.

Dr. and Mrs. H. L. Coffin, of Adair, Iowa, a daughter, Janelda Ann, April 5, 1923.

Dr. and Mrs. L. P. Johnson, of Oakland, Nebr., a son, Loren Paul, January 11, 1923.

Dr. and Mrs. I. Kleveland, of Sioux Rapids, Iowa, a son, Rodney, December 19, 1922.

Dr. and Mrs. W. W. Williams, of Springfield, Mass., a daughter, Rosalind, April 17, 1923.

Dr. and Mrs. P. E. Simard, of Montreal, Que., a daughter, Mary Phoebe, January 4, 1923.

Dr. and Mrs. W. A. Jones, of Johnson City, Tenn., a son, William A. Jr., January 14, 1923.

Dr. and Mrs. H. D. O'Brien, of Danville, Ill., a daughter, Rebecca Joyee, December 18, 1922.

Dr. and Mrs. G. N. Russell, of Lawrence, Kan., a daughter, Elizabeth Leigh, January 7, 1923.

Dr. and Mrs. Homer C. Boyd, of Texhoma, Okla., a daughter, Delois Elaine, March 24, 1923.

Dr. and Mrs. Wilbur R. Kidwell, of Boise, Idaho, a daughter, Margaret Louise, January 3, 1923.

Dr. and Mrs. G. L. Schaefer, of Tekamah, Nebr., a daughter, Elizabeth Josephine, January 16, 1923.

PERSONAL

Dr. W. H. Lake is Mayor of the town of Morden, Manitoba.

Dr. Roy Rowe (Corn. '16), has removed from Little Falls, N. Y., to Miller-ton, N. Y.

Dr. B. J. Cady (Corn. '04), has left Olean, N. Y., and is now at Belmont, same state.

Dr. Herbert Howard (Chi. '18), has removed from Columbia City, Ind., to Leesburg, Va.

Dr. H. R. Schwarze (Chi. '07), is now with the Corn Belt Serum Company, of East St. Louis, Ill.

Dr. William Harward (U. S. '17), has been transferred from Lake City, Fla., to Oakboro, N. C.

Lt.-Col. Charles H. Jewell (Corn. '00), U. S. Army, retired, is now located at Junction City, Kans.

Dr. John W. Hermann (Cinn. '13), formerly of Owensboro, Ky., has been located at Windsor, N. C.

Dr. Horst Schreck (Ind. '16), is now in Kansas City, Mo. He gives his address as 4201 Locust St.

Dr. Charles W. Selemeyer (U. P. '21), has been appointed City Meat and Milk Inspector of York, Pa.

Drs. Chas. H. Greenfield (Chi. '12) and G. Floyd Ewalt (Ont. '14), of Detroit, Mich., have formed a partnership.

Dr. E. T. Hallman (Ala. P. I. '10) fills the classification of Veterinarian, in the Rotary Club, of Lansing, Mich.

Dr. J. B. Way (K. C. V. C. '14), is now located at Elkton, Ky. He was formerly at Hopkinsville, same state.

Dr. W. E. Dodd (K. C. V. C. '18) has been transferred from Little Rock, Ark., to Boise, Idaho, c/o Dr. W. A. Sullivan.

Dr. Joseph P. Gerety (U. P. '10), until recently in the Army service, is located at 1640 River Ave., San Antonio, Texas.

Dr. C. S. Elliott (Ont. '84) has requested that his address be changed from Arcanum, Ohio, to 204 Euclid Ave., Greenville, Ohio.

Dr. H. E. Johnston (Iowa '13), writes that he has been transferred from Fargo, N. D., to Algona, Iowa. His address is 6 Liberty St.

Dr. D. C. Beaver (Mich. A. C. '18) is a part-time assistant in pathology and is also registered as a student in the Detroit College of Medicine.

Dr. V. P. Norton (Gr. Rap. '05) of Wisconsin Rapids, Wis., is Wisconsin State President of the National Single Comb White Leghorn Club.

Dr. G. R. Beavers (McK. '10) of Strawberry Point, Iowa, is a breeder of Single Comb Rhode Island Reds and Single Comb Black Minorcas.

Dr. H. C. Rogers (Chi. '06), of Audubon, Iowa, says that a veterinarian would soon become fossilized if he did not read the JOURNAL regularly.

Dr. Edgar L. Olson (McK. '20), formerly at Fort Whipple, Prescott, Arizona, is now in Minneapolis, Minn. His address is 5209 37th Ave., So.

Dr. J. R. Morse (Corn. '13), who has been practicing at LeRoy, N. Y., has accepted a part interest in the practice of Dr. J. F. DeVine, of Goshen, N. Y.

Dr. H. L. Van Volkenberg (Corn. '18), formerly at the U. S. Experimental Fur Farm, Keeseville, N. Y., has been transferred to St. Paul Island, Alaska.

Dr. M. M. Davis (McK. '15), formerly of Mt. Hope, Wis., has accepted an appointment with the Bureau of Animal Industry, and is now stationed in Chicago.

Dr. Henry E. Kreidler (U. P. '20), of Red Lion, Pa., has accepted a position as Claim Agent with the Association of Railroads, and is located at Jersey City, N. J.

Dr. F. E. McClellan (Corn. '09), of Buffalo, N. Y., was the speaker at the Forum of the Veterinary College, at Cornell University, May 4th. He gave an interesting and instructive talk on his experience in the practice of veterinary medicine.

Dr. Frank H. Miller (McGill '87) was in Ithaca, N. Y., April 27-28, attending a meeting of the Board of Trustees of Cornell University, of which Board he is a member.

Dr. O. E. Gladfelter (U. P. '17), formerly of Seven Valleys, Pa., has located at York, Pa., where he will open a small animal hospital and make a specialty of canine practice.

Dr. Archibald R. Ward (Corn. '01) is now located in Detroit, Mich., with the Frederick C. Matthews Company, an organization of technical advisers for dairy manufacturers.

Major Olaf Schwarzkopf (Berl. '80) U. S. Army, retired, is now travelling in Europe. He is receiving his mail in care of the American Consul, 24 Victoria Str., Coblenz, Germany.

Dr. Carl W. Gay (Corn. '99), of the Ohio State University, acted as judge of draft horses at the Philadelphia Indoor Show, which was held at the Squadron Armory, on May 2-5, 1923.

Dr. Edward Morgan, writing from Puerto Cabello, Venezuela, after having read the March JOURNAL, writes, "We have no doubt whatever about its valuable contents in the future."

Dr. B. M. Underhill (U. P. '95), addressed the regular meeting of the Schuylkill Valley Veterinary Association, on April 18th, on the subject of "Internal Parasites, Their Diagnosis and Treatment."

Dr. A. R. Mahan (San Fran. '17), after more than five years with the Bureau of Animal Industry and the U. S. Army, has decided to go into practice. Dr. Mahan has located at Marysville, Cal.

Dr. W. E. Coomer (Gr. Rap. '06) is chairman of a committee appointed to set a standard of prices for tuberculin testing and hog cholera immunization for the Michigan State Veterinary Medical Association.

Dr. Frank D. Porter (Ind. '16), formerly stationed at Evansville, Ind., on hog cholera control work, has been transferred to Fort Worth, Texas, on stock yard inspection and quarantine work, with the Bureau of Animal Industry.

Dr. Joseph Hawkins (Ont. '71) was among those injured in a train wreck which occurred recently near Salt Lake City. Dr. Hawkins was returning East from his winter's sojourn in California. His injuries were reported as not serious.

Dr. Ward Giltner (Corn. '06) was the leading speaker at the meeting of the Detroit Branch of the Society of American Bacteriologists, May 16, 1923. His topic was, "The Laboratory of Bacteriology at the Michigan Agricultural College; Its Work."

Dr. Maurice C. Hall (Geo. Wash. '16), our distinguished helminthologist, received quite a write-up in a recent issue of Henry Ford's *Dearborn Independent*. It is to be hoped that everybody who read the article was able to deduce that Dr. Hall is a veterinarian. This fact was not brought out very plainly, however.

Dr. S. Brenton (Ont. '80), of Detroit, Mich., after having had the same telephone number for over thirty-five years, was recently compelled to have it changed, incident to the installation of automatic telephone exchanges in the Motor City. The change was slight, however, from 969 to 0969, to give the number four digits.

Lawton, Mich., can boast of a veterinarian who is something of a financier, even in these times of depression. Dr. E. C. Goodrich (G.R. '15), is President of the First National Bank, Vice-President and General Manager of the Commonwealth Mortgage Company, and owns a large grape farm. On top of all this he is Mayor of the City.

Dr. H. W. Turner (U. P. '93) who is with the Pennsylvania Bureau of Animal Industry, and also Chairman of the A. V. M. A. Committee on Prevention and Control of Animal Diseases, has been doing some valuable educational work by addressing farmers' meetings on the subject of the prevention of transmissible diseases of farm animals.

Dr. Jacob Traum (N. Y. S. V. C. '05), who is on leave of absence from the University of California, engaged in post-graduate work at Cornell University, is endeavoring to have his leave extended beyond July 1st, so that he may be able to take part in the program of the New York State Veterinary Medical Society meeting, to be held at Ithaca, July 25th, 26th and 27th.

Dr. Jacques E. Aghion, (Ont. '07), of Sakha, Egypt, writes that he is back home after an absence of three and one-half months, spent in visiting the veterinary colleges of Europe. He spent some time in Austria, Germany, Belgium, France and Italy. Dr. Aghion has been elected, for the third year, as a member of the Committee to the Egyptian Veterinary Medical Society.

Dr. Russell A. Runnells (Mich. A. C. '16) accompanied the senior veterinary class of the Michigan Agricultural College, on their annual pilgrimage to Detroit early in May. The class visited a number of the large packing plants; the Detroit Creamery Company's horse barn, in Detroit, and certified dairy, at Mt. Clemens; Parke, Davis and Company's laboratories, in Detroit, and biological farm, at Rochester; the Detroit College of Medicine; and a number of veterinary hospitals in the Motor City. In the evening of May 2nd the students were the guests of Dr. S. Brenton, at a dinner, given at the Michigan Club.

A WOBBLIN' DOBBIN

Cake Eater (at dance): "What is that step that couple is doing?"

Ditto: "That's the horse walk."

Cake Eater: "Why call it the horse walk?"

Ditto: "Wagon behind."—*'Ee-'Aw.*

SERIOUS

Maid: "I couldn't come yesterday, Miss Jackson. I was suffering that badly with pain in my chest."

Mistress: "What was it, Melissa? Dyspepsia?"

Maid: "Yes'm, it was. But the doctor, he calls it an attack of acute indiscretion."—*Bulletin of Pharmacy.*

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JOURNAL

OF THE

American Veterinary Medical Association

FORMERLY AMERICAN VETERINARY REVIEW

(Original Official Organ U. S. Vet. Med. Ass'n.)

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July, 1923

No. 4

AN APPRECIATION OF VETERINARY SERVICE

On another page of this issue we are reprinting an editorial, entitled "The Loss From Animal Diseases is Diminishing," from *The Weekly Kansas City Star*, of June 6, 1923, a publication having a circulation of 360,000. This splendid tribute to the value of veterinary service was written by Dr. H. J. Waters, the Managing Editor. We wish that it might be read by every farmer and breeder in the country.

Dr. Waters was formerly Dean of the Agricultural Department of the University of Missouri, later President of the Kansas State Agricultural College, which post he left to take up his present connection with the *Weekly Kansas City Star*. In all of these positions Dr. Waters has had many opportunities to become acquainted with members of the veterinary profession and their activities. It is only too evident that he has been favorably impressed and fully appreciates the true worth of competent veterinary service.

But Dr. Waters' acquaintance with veterinarians and their work had even an earlier beginning than as mentioned above. Many years ago, as a student, in the agricultural course at the University of Missouri, then later as assistant to the Dean, in the administration of the work of the college farm, Dr. Waters came

in contact with Dr. Paul Paquin, then Professor of Veterinary Science. Dr. Paquin was a graduate of the Veterinary Department of McGill University and later pursued courses of study in French bacteriological laboratories, while Pasteur was yet alive and so potent a factor in stimulating and fostering such studies.

Another man with whom Dr. Waters came in early contact was the late Dr. Leonard Pearson, Dean of the Veterinary School of the University of Pennsylvania. The two men were brought together quite intimately while Dr. Waters was Professor of Agriculture at the Pennsylvania State College. A very warm friendship for each other developed between them, kindled through the admiration the one had for the other, mutually interested as they were in live stock production and conservation, or, as it pleased Dr. Pearson to call it—animal engineering.

On many occasions Dr. Waters has shown his deep appreciation of the high value of the unselfish efforts of the veterinary profession. It is indeed fortunate that the foundations for Dr. Waters' friendship for the veterinarian were so well laid, through his acquaintance with the work and the ideals of such sterling representatives of the profession as Paquin and Pearson. There are other, present-day veterinarians, (Connaway, of Missouri, and Dykstra, of Kansas, are conspicuous examples), who have made their impress on Dr. Waters, during more recent years, and it is to be hoped that we will continue to deserve and to enjoy the confidence placed in us by such outstanding men as Dr. Waters.

AS OTHERS SEE US

In a recent issue of *The Breeders' Gazette* there was an editorial entitled "Work for Veterinarians." The writer of this very timely and appropriate editorial is evidently well posted on conditions in the veterinary profession at the present time. The writer tells the stockman very plainly that competent veterinary services are too frequently undervalued and their worth too poorly appreciated. He says:

"A number of veterinary inquiries come to us from breeders and stockmen living in communities in which there are no "graduate veterinarians" to consult. Some of the practicing members of this profession are not adequately trained in veterinary science, as it is taught today in the best institutions.

"We are not indicting a profession: veterinarians as a class are probably as competent and conscientious as any other class of professional men. We are merely pointing out that in some communities stockmen either

do not have access to the best grade of veterinary talent or are compelled to patronize practitioners whose qualifications are technically meagre.

"Every stockraising community, however, has as efficient a veterinarian as it will support; if it demanded a better-trained man, it would have him, although there is a shortage of highly-trained veterinarians. 'There is a reason': it is that veterinary service has not been sufficiently recognized and rewarded in this country to induce many young men of the best grade to educate themselves for the profession. Some of those who have engaged in it are not properly educated for the increasingly difficult work which they are called upon to do.

"Stockmen are largely responsible not only for what patently is a low grade of veterinary service, in some regions and instances, but for America's shortage of veterinarians who are fully qualified for the highest grade of professional work."

A suggestion is offered for developing the "community veterinarian" idea. A full appreciation is expressed of the greater value of prevention of disease, as against curing disease that has been allowed to develop. We have often wondered why somebody did not try the idea herein expressed. Perhaps it borders too closely on state medicine. The greatest draw-back, as we see it, is that no veterinarian will want to do the "drudgery" of routine practice, or the part that is left after the cream has been skimmed off by the community veterinarian under contract. That is the condition which partially exists now, and to which our practitioners are objecting, in those states where Federal and State veterinarians are doing most of the tuberculin testing.

"THE GAZETTE's opinion is that many an established, organized stockraising community could well afford to employ a well-trained veterinarian by the year. His business would be to instruct and advise breeders in regard to animal hygiene and sanitation; to assist them in keeping their herds, flocks and studs healthy; to conduct tests, administer vaccines, biologics and treatment, when necessary; to certify to the health and sexual soundness of stock offered and sold; to act for breeders in all matters involving state and Federal regulations. As a live stock sanitarian, specializing in work designed to keep stock healthy, he would be worth much more to his employers than he could earn by treating developed cases of disease. The prevention of diseases is more economical and important than treating them. When communities in which stock-raising is an established adjunct to farming begin employing or feeing graduate veterinarians for this kind of service, the "crop" of men qualified to serve the industry in accordance with modern veterinary science and practice will automatically increase.

"The future development, stability and practical value of the improved live stock industry will, to a greater extent than in the past, depend upon clean bills of animal health, vouched for by owners and veterinarians, and confidently accepted by purchasers. The selling of diseased or sterile animals for breeding purposes, whether it be a deliberate practice of the unscrupulous or an act of ignorant innocence, must cease. We are pleased to add that in recent years it has made reassuring progress toward cessation. It has long been outlawed by the conscience of the rank and file of breeders. The necessary next step is for breeders to place themselves in a position to issue clean bills of animal health, based upon a responsible, competent, veterinary service".

As a matter of fact, no territory having valuable live stock will be without competent veterinary services very long. On

the other hand, there are considerable areas, containing insufficient live stock to afford a veterinarian a decent living. It is usually from such territories that our farm papers receive the majority of their veterinary inquiries, mentioned in the opening paragraph of the editorial quoted. Very few such inquiries come from territories enjoying competent veterinary service.

Plan To Go To Montreal, August 27-31.

GET A NEW MEMBER

The 1923 membership campaign is under way. There never was a time when organization was so sorely needed by the veterinary profession. Every other force is organized. To call attention to the spread of "farmer vaccination" is simply directing attention to the results of organization. The farmers are organized. We do not say *well* organized. Many there are who doubt the solidity or the permanence of the present form of their organization. But the fact remains, they are organized.

So it behooves all forward-looking veterinarians to lend their support to our national organization. What is asked of each individual is small enough, indeed, but the sum total of our combined support can be productive of an enormous amount of good. There is not the slightest reason to think that the efforts of our Association will not be well directed in the future. While things were going well, we perhaps were too easily contented with what was accomplished in the past.

We are on the threshold of a new day. We are going to do things never attempted before. The report of the Committee on Policy, which will be presented to the members at Montreal, will contain a great many recommendations. To carry out the activities suggested in this report will require considerable money, more than is represented in the income of the Association, in the form of dues from our present membership. There is but one logical solution—a larger membership—which means a larger income.

Get in touch with the Resident Secretary of your State. Cooperate with him and give him all possible assistance in getting new members into the fold. We have prepared some mighty fine letters for some of our resident secretaries to send to their prospects. But these letters, as splendid as they are, will not accomplish the maximum in the way of results, unless they are

supplemented with a little personal touch. Call on your brother practitioner, who is not a member. Sell him on the merits of our national organization. Get him in. We need him. He needs us, too.

Have You Secured One New Member This Year?

VITAMIN THERAPY

Vitamin therapy, if such term may be used, now seems to be suffering the penalties of unrestrained, commercial exploitation. This is probably more manifest in human practice than in veterinary practice, as the fad received a greater impetus among people than animals.

Today, the greatest interest seems to be centered around the possibilities of yeast therapy, and whether vitamin B, in the form of yeast, will do the things which are being claimed for it. The protocols of certain experiments, upon which certain present claims are being made, would suggest that these experiments had not been conducted over a sufficiently long period of time.

Some claims are being made that yeast is a food. This is stretching the truth and no thinking individual should go astray on this score. Yeast has been used in veterinary medicine for a long time. It was used before we had nuclein, and when we became acquainted with nuclein, together with its therapeutic properties, credit was given to the nuclein in the yeast, for whatever good the latter accomplished.

There is no denying the fact that vitamins exist, and that the absence of one or more of them from the diet, for any length of time will be followed by disturbed metabolism, in certain genera of animals, at least. Some animals can apparently thrive without all the vitamins being present in the diet. Possibly these animals may have the power to synthesize these vitamins, although it has been believed that this takes place only in the vegetable kingdom.

What is needed most at the present time, is a comprehensive investigation to determine, if possible, whether there are vitamin-deficiency diseases among our animals, and if so, how extensive are these diseases. We must guard against the natural, present-day tendency to call every new condition a deficiency disease, until we know the exact nature of it.

Next, it should be determined whether such deficiency diseases

can best be treated by supplying the missing factors, (a) in the form of a natural food, (b) in the form of yeast (if it is vitamin B that is lacking), or (c) in scientifically prepared vitamin extracts, containing either single vitamins, or all known varieties in a balanced combination. We hope that somebody will undertake such an investigation.

We Want 5000 Members This Year.

FORD RIDES, BUT NOT ON WHEELS

A Detroit paper recently published, on the same page, two articles concerning Henry Ford. In one the flivver magnate was credited with having made the following statement: "The world is on wheels and will never get off." In the other article, which had to deal with Mr. Ford's aspirations for the presidency, the Detroit wizard showed a willingness to talk on almost any other subject, and among other things said: "I feel fine this morning. I arose early and rode horseback from 6 to 7."

These two rather conflicting statements prompt us to remark that we are pleased to note that Mr. Ford still knows how to get real enjoyment and healthful exercise, simultaneously, but we must take issue with him when he says that the world is to remain indefinitely on wheels. Mr. Ford may have hobbies, but we doubt if it was a hobby-horse that he was riding, between 6 and 7, on the morning of May 29th. He usually demands something with a little more action.

Does Your Wife Know About The Women's Auxiliary?

THE FUNCTION OF OUR JOURNAL

To establish and maintain ethical standards for American veterinary literature, which may be taken as a standard for veterinary literature the world over; and at the same time to cultivate the tastes of our members for the right kind of veterinary literature, as exemplified by the articles, discussions and reports published in these pages.

To serve as an accurate chronicle for current events in and pertaining to the veterinary profession, to the end that a reliable record of such events be left for the generations that will come after we have passed on. Let us strive to make this record always one of veterinary progress.

To direct attention, if and when necessary, to any conditions in our own midst, which need correction; not in the spirit of muck-raking or mud-slinging, but with the sole purpose of bringing about a cure for the condition, and that right early, before the cancer shall destroy us, or even impair any part of our structure.

To serve as a forum for the discussion, always in a scholarly and dignified way, of the problems with which the members of our profession find themselves continually confronted, and for which it is hoped that solutions may be obtained through the exchange of opinions.

To provide a sufficient variety of reading matter, so that there will always be something to attract and hold the interest of every member, regardless of the branch of the profession in which he may be engaged.

Have You Secured One New Member This Year?

MONTREAL TO BREAK ALL RECORDS

Indications point to a record attendance at the "Diamond Jubilee" meeting of the A. V. M. A., Montreal, August 27-28-29-30-31. Requests for reservations of rooms at the Mount Royal Hotel are pouring in. If you do not wish to be disappointed in this respect, do not delay writing for your reservation.

The program is taking form. The section officers report their sectional programs practically complete. The Local Committee on Arrangements is holding frequent meetings. A number of sub-committees have been appointed to look after the many details which are so essential to have everything run smoothly.

One whole day (Wednesday) has been set aside for a clinic, sectional in character and designed to interest all branches of the profession, it being felt that the policy inaugurated last year at St. Louis, offering special inducements to general practitioners, should be continued. Otherwise the convention is liable to turn into a mere holiday, or a "paper-presentation ceremony," with the majority of the members making themselves comfortable on the home veranda, in anticipation of the pleasure they will have at digesting the scientific side of the whole program in the JOURNAL.

The evening of the clinic day will see the gathering of the members at the memorable banquet (the first since Columbus,

in 1920), to be given at the Mount Royal Hotel. The members of the Committee are so sanguine in their hope that the banquet will be a huge success that it has also been decided to make the following day a "light" one, with a recess of a few hours—another innovation—before the motor- and boat-ride, which will take the members around the island of Montreal and down the world renowned Lachine Rapids, as guests of the City of Montreal.

The convention proper will assume an international aspect with at least three European delegates, who will take an active part in the program, and, as already announced, Sir Stewart Stockman, of Edinburgh, has consented to be present, while the latest news at hand is that Sir Arnold Theiler, C. M. G., of Pretoria, Transvaal, Director of Education and Research of South Africa, will be present and will contribute to make the meeting a beneficial one for all the members.

The delegate from France is expected to be appointed soon, by the French Government, and his name is eagerly awaited by those who have been in touch with the progress of modern veterinary science on the other side of the ocean.

As a celebration of the "Diamond Jubilee" of the Association, the convention will, in some respects, be unique, and certainly most interesting throughout. It should be a real appropriate "sparkling" event, to watch the leading lights in their own fields of Great Britain, France, South Africa, the United States and Canada, compare their experiences and hear each tell the why and the wherefore of his own distinctive policy.

Members of the Association who desire information of any nature, in connection with their intended visit to Montreal, will receive prompt replies from the Secretary of the Local Committee, Dr. J. H. Villeneuve, 200 West Dorchester Street, Montreal.

J.H.V.

Plan To Go To Montreal, August 27-31.

CONTINUING OUR HALL OF FAME

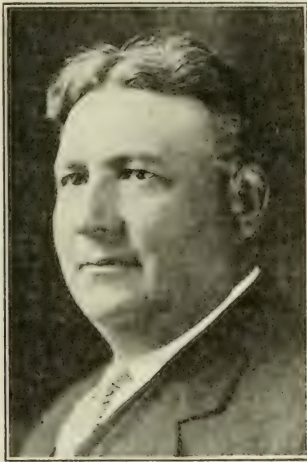
Dr. John E. Wurm, who has just completed a term of office as President of the Michigan State Veterinary Medical Association, is a "big" veterinarian in more ways than one. He is big physically, but he is also big mentally, professionally, politically and commercially, as the following brief biographical sketch will show.

Born on a farm near Ubly, Michigan, November 19, 1878, he

has been agriculturally inclined all his life. He runs a stock farm in connection with his various other pursuits, and specializes in the breeding of Shorthorn cattle.

He attended the common schools of his district, and entered the Ontario Veterinary College. He "put himself through" and graduated in 1902. He immediately located in Elkton, Mich., and established a practice there. In 1909 he removed to Pigeon, Mich., where he has been ever since, very much of a fixture and a large part of Pigeon.

For eight years he was a member of the Common Council of the village of Pigeon. Then he was promoted to President and



DR. JOHN E. WURM

served two terms. He has Republican leanings, and during the War was Chairman of the War Board of Pigeon. He is secretary-treasurer of a number of commercial enterprises in Huron County. He is a Mason and Shriner.

Dr. Wurm is an active association worker. He believes in organization. He believes in playing fair. The value of his sterling qualities in these respects was brought out in the recent fight in the Michigan Legislature, when an attempt was made to "put over" farmer vaccination in the Wolverine State. It is

largely to Dr. Wurm's leadership and his ability to organize and direct his fighting forces, that this iniquitous piece of legislation was defeated. And, best of all, the fight was fought fairly, as attested by one who was desirous of having the bill pass.

Dr. Wurm is a busy practitioner. He has a very large and lucrative practice. One of the main reasons why he has been able to build up such a practice is because he is always interested in his clients' welfare, always ready to serve, and always willing to help. He has an in-born love for animals, which must be a part of a veterinarian's equipment, if he is to be successful as a general practitioner.

To prove further that Dr. Wurm is perfectly human, it might be added that he is an enthusiastic fisherman. Every year he steals away to the trout-streams of Northern Michigan. He has a summer cottage at Bay Port, where he frequently entertains his friends, particularly those who are piscatorially inclined.

Dr. Wurm has been a member of the American Veterinary Medical Association since 1910. He and Mrs. Wurm have attended quite a few of the meetings. They are planning to go to Montreal, "with the crowd." We almost forgot to mention that Dr. Wurm is Resident Secretary for Michigan this year and is now in the midst of an active campaign for new members. He is never too busy to lend a hand in any worthy undertaking.

We want to hear of more men of this type. We now have Welch, of Illinois; Faust, of New York; Lowe, of New Jersey; Haines, of Pennsylvania; and Wurm, of Michigan. Who is next?

We Want 5000 Members This Year.

EXECUTIVE BOARD ELECTIONS

The polls for the election of members of the Executive Board, for Districts Nos. 2 and 3, are closed and a count of the ballots cast indicates the re-election of Dr. T. E. Munce, of Harrisburg, Pa., in District No. 2, and the election of Dr. David S. White, of Columbus, Ohio, in District No. 3, to succeed Dr. S. E. Bennett, of Chicago, Ill., whose term of office will expire at the close of the meeting in Montreal. The count of the ballots was as follows:

DISTRICT NO. 2

T. E. Munce	210
Adolph Eichhorn	49

J. F. DeVine.....	36
Robert S. MacKeller.....	34
Wm. Herbert Lowe.....	15

DISTRICT No. 3

David S. White.....	106
L. A. Merillat.....	77
S. Brenton.....	52
T. H. Ferguson.....	44
E. L. Quitman.....	34
Reuben Hilty.....	26

Does Your Wife Know About The Women's Auxiliary?

THOMAS EDWARD MUNCE

Dr. T. E. Munce, who has just been re-elected as member of the Executive Board, for District No. 2, was born on a farm in Washington County, Pennsylvania, April 26, 1877. At the age of twelve years his parents moved to Washington, where he completed the public school course and attended Washington and Jefferson College. With a brother he returned to the farm and for five years engaged in the breeding and raising of pure bred cattle, sheep and swine.

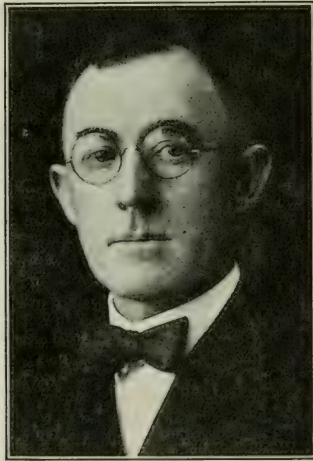
After completing his preliminary education he entered the School of Veterinary Medicine, University of Pennsylvania, graduating with the class of 1904. Following three years of general practice Dr. Munce took up livestock regulatory work, being appointed an agent of the Bureau of Animal Industry, Pennsylvania Department of Agriculture, July 1, 1907.

His advancement in the veterinary profession has been rapid. Starting as a field veterinarian he gradually advanced until he was appointed, by the Governor, Deputy State Veterinarian in 1909 and State Veterinarian in 1919, the position which he now holds. He has seen the Pennsylvania Bureau of Animal Industry grow from a personnel of eleven to nearly one hundred and is the senior member of the force in years of service. Through the leadership of Dr. Munce, his Bureau has become the largest one in the Pennsylvania Department of Agriculture.

In addition to his numerous duties as Director of the Bureau of Animal Industry, Dr. Munce has been closely and actively identified with the veterinary profession and its activities throughout the United States. He organized the first local veterinary

club in Pennsylvania and has been intimately associated with the organization of the twelve others which have since been formed. He is past President of the Pennsylvania State Veterinary Medical Association, also of the United States Live Stock Sanitary Association.

In the year of his graduation Dr. Munce became a member of the American Veterinary Medical Association and has ever since, as a member and officer of the Association, been an indefatigable worker. For several years he has advocated a working policy for the A. V. M. A. He was the author and sponsor of the resolution recently adopted by the Executive Board which provided for the



DR. T. E. MUNCE

appointing of a special committee to draft such a policy for the Association, and was made Chairman of that Committee.

Dr. Munce has not confined his interests solely to the veterinary profession. He believes that the welfare of his profession can be best served by being affiliated with those organizations which tend toward the advancement of his immediate community and the betterment of the country at large.

It is with pride that he points to his membership in the Harrisburg Rotary Club, in which organization he is identified with the "Big Brother" movement, the Chamber of Commerce and

the Harrisburg Motor Club. He is a bank director and is also interested in church affairs.

Dr. Munce never overlooks the opportunity to impress upon his fellow veterinarians their responsibilities and the part they should play in the economic, social and religious activities of their respective communities.

Have You Secured One New Member This Year?

DAVID STUART WHITE

Any introduction to Dr. David S. White, member-elect of the Executive Board for District No. 3, is highly superfluous. It is such a short time since Dr. White served the Association as President, that the memory of his executive ability is still fresh in the minds of our members.



DR. DAVID S. WHITE

It is as a veterinary educator that Dr. White has cut his deepest notch. Today he enjoys the distinction of being the oldest full-time veterinary teacher, from the standpoint of years of continuous service, on any veterinary faculty in America. This year he rounds out his thirtieth year as a member of the faculty of Ohio State University.

In electing Dr. White to the Executive Board, the veterinarians of District No. 3 have placed him in a position where he can help to direct the policies of the Association along certain lines he advocated while President. It used to be a custom, in the Association, for the outgoing President to be made chairman of the Executive Board, so that he might further any policies, started as President, and otherwise cut short by his relinquishment of the office.

A full biographical sketch of Dr. White's career appeared in the JOURNAL, October, 1920, just after he was elected President of the Association. For fuller details of this useful career we refer our readers to that sketch. Suffice it to say here, that "Davey" (the fond sobriquet used by those who know him best) richly deserves his new honor. Few there are who may point to a cleaner record as a serious student, a practical veterinarian, a thorough teacher, an able writer and a good soldier.

Plan To Go To Montreal, August 27-31.

GET YOUR LAPEL EMBLEM

If we are obliged to take a large number of lapel emblems to Montreal, it will be necessary to pay duty on them. This can be avoided by our members getting their emblems in advance. If you are going to Montreal (pretty nearly everybody we have asked, thus far, says he is going), secure your emblem before you go. If it is not convenient for you to secure a postal money order for fifty cents, drop us a line and ask us to mail you an emblem, charging it to your account. You can pay for it when you pay your dues for next year. Better still, pay these dues *now*. They become due September first. Twenty-five members have already paid their dues one year in advance. Yes, it is a good sign. Things are improving right along.

We Want 5000 Members This Year.

ADDRESS YOUR MAIL CORRECTLY

During the past few months a great many letters sent us have been delayed in delivery, owing to the fact that they were insufficiently addressed. Many of these letters contained remittances. Others were of equal importance for other reasons. We have received mail, intended for the JOURNAL, that have been

forwarded from every place where the JOURNAL was ever published, including New York City, Ithaca, N. Y., Baton Rouge, La., and Washington, D. C. Former Secretary Dr. N. S. Mayo, continues to receive many letters intended for this office. We have but one address:

735 BOOK BUILDING, DETROIT, MICHIGAN

Address your mail accordingly, if you please!

Does Your Wife Know About The Women's Auxiliary?

**WELL BALANCED PROGRAM FOR MINNESOTA
MEETING**

Secretary Fitch has arranged a splendid program for the 25th semi-annual meeting of the Minnesota State Veterinary Medical Association and Short Course, to be held at University Farm, St. Paul, Minn., July 18-19, 1923. There will be three sessions on the first day (Wednesday) and two on the second (Thursday). Among the subjects which will receive attention are: Ovariectomy in the cow, impaction of the rumen, circulatory stimulants, small, animal anesthesia, poultry diseases, vaginal prolapse, azoturia-caponizing, swine diseases, stricture and atresia of the udder, case reports, horse talks, etc. Those who will take part in the program, from out of the State, include Dr. H. E. Bemis, of Ames, Iowa; Mr. Wayne Dinsmore, Chicago, Ill.; Mr. W. S. Corsa, of Whitehall, Ill.; Dr. John Patterson, of Hedrick, Iowa; and Dr. L. Van Es, of Lincoln, Nebr.

Have You Secured One New Member This Year?

TO THE LADIES OF CANADA

Greetings!

The members of the Women's Auxiliary of the A. V. M. A. salute you! We are looking forward with much pleasure to meeting with you. We hope you may like us and become interested in our work. One of your own young men has applied to us for financial assistance from our loan fund. This should insure your interest and cooperation. We hope that many of you will become members this year. Let us all work together to make this the greatest meeting in our history.

D. I. L.

COMING VETERINARY MEETINGS

- Oklahoma State Veterinary Medical Association. Medicine Park, Okla. July 9-10, 1923. Dr. L. B. Barber, Secretary, Live Stock Exchange Bldg., Oklahoma City, Okla.
- Illinois State Veterinary Medical Association and Fourth Annual Veterinary Conference. Urbana, Ill. July 10-11-12, 1923. Dr. L. A. Merrilat, Secretary, 4753 Grand Boulevard, Chicago, Ill.
- Western New York Veterinary Medical Association. Dr. Anderson Croforth's Hospital, 180 Walnut St., Lockport, N. Y. July 12, 1923. Dr. F. F. Fehr, Secretary, 243 So. Elmwood Ave., Buffalo, N. Y.
- New Jersey, Veterinary Medical Association of. Hotel Marlborough, Asbury Park, N. J. July 12-13, 1923. Dr. P. B. Silvester, Secretary, Princeton, N. J.
- Virginia State Veterinary Medical Association. Ocean View, Va. July 12-13, 1923. Dr. Geo. C. Faville, Secretary, Hampton, Va.
- Minnesota State Veterinary Medical Association. University Farm, St. Paul, Minn. July 18-19, 1923. Dr. C. P. Fitch, Secretary, University Farm, St. Paul, Minn.
- Missouri Valley Veterinary Association. Omaha, Nebr. July 23-24-25, 1923. Dr. E. R. Steel, Secretary, Grundy Center, Iowa.
- Kentucky Veterinary Medical Association. Lebanon, Ky. July 25-26, 1923. Dr. J. A. Winkler, Secretary, Newport, Ky.
- New York State Veterinary Medical Society. Ithaca, N. Y. July 25-26-27, 1923. Dr. C. E. Hayden, Secretary, Ithaca, N. Y.
- New York City, Veterinary Medical Association of. Academy of Medicine, 17 W. 43rd St., New York, N. Y. August 1, 1923. Dr. C. G. Rohrer, Secretary, 40 W. 61st St., New York, N. Y.
- Washington State Veterinary Medical Association. (Joint meeting with British Columbia Veterinary Association.) Portland, Ore. August 2-3-4, 1923. Dr. Carl Cozier, Secretary, 320 Prospect St., Bellingham, Wash.
- American Veterinary Medical Association. Mount Royal Hotel, Montreal, Canada. August 27-28-29-30-31, 1923. Dr. H. Preston Hoskins, Secretary, 735 Book Bldg., Detroit, Mich.

Plan To Go To Montreal, August 27-31.

STUDIES IN COMPLEMENT FIXATION IN BOVINE TUBERCULOSIS¹

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I. THE INFLUENCE OF HEATING SERA AND THE KIND AND DURATION OF PRIMARY INCUBATION UPON THE OCCURRENCE OF SPECIFIC AND NON-SPECIFIC TUBERCULOSIS COMPLEMENT FIXATION TESTS WITH CATTLE SERA.

INTRODUCTION

While tuberculosis of human beings was one of the first diseases in which the complement fixation test was applied, the results were so largely of a negative character that the matter attracted but little attention. Within recent years, however, interest in the subject has been renewed and a rather large literature has accumulated insofar as complement fixation in human tuberculosis is concerned.

An analysis of this literature shows quite a difference of opinion on the occurrence, specificity and practical diagnostic value of the reaction in human tuberculosis. Some investigators have reported most favorably in that the reactions were found highly specific, very sensitive and a reliable index of the presence of active tuberculosis with special reference to tuberculosis of the lungs. Other investigators have not been able to substantiate these results, reporting that while positive reactions may occur, the degree of complement fixation was usually weak and the test of little or no value as a diagnostic procedure.

Much less work of this kind has been conducted with the sera of cattle. The tuberculin test having proven its reliability and sensitiveness as a practical diagnostic procedure has removed in large part the demand for other diagnostic tests. However, since the results of the tuberculin test may be modified or sup-

¹From the Research Institute of Cutaneous Medicine of Philadelphia and the Laboratories of the Bureau of Animal Industry of Pennsylvania. Presented at the fifty-ninth annual meeting of the American Veterinary Medical Association, St. Louis, Mo., August 28 to September 1, 1922.

pressed in tuberculosis under certain conditions, if a sensitive and specific complement fixation test could be developed it would prove of value as an additional diagnostic procedure for the practical management of a disease of great economic importance.

Furthermore a study of complement fixation in tuberculosis of cattle would appear to be a better means for studying the specificity and sensitiveness of the reaction than is possible in tuberculosis of human beings, in view of the possibilities for checking up the results by tuberculin tests and through necropsy examinations. The present studies were undertaken as part of an extensive series of investigations by one of us (J. A. K.) on the general subject of Complement Fixation In Bacterial Infections as continuing studies of this kind conducted during the past six years on the Standardization of the Wassermann Reaction for syphilis¹. Our special purpose was to determine the value of the new complement fixation test for syphilis based upon these investigations in the standardization of technic², when applied to tuberculosis of cattle, an antigen of tubercle bacilli supplanting of course, the lipoidal extracts employed in the syphilis test.

As previously stated most reported work on the tuberculosis complement fixation test has been conducted with human sera. Studies with cattle sera have been made by Bach³, Christian and Rosenblatt⁴, Porter⁵, Wysehelewsky⁶, Hammer⁷, Bierbaum and Beidel⁸ and others. The most recent and valuable contribution has been made by Eichhorn and Blumberg⁹ who tested 958 sera with different antigens and concluded that the tuberculosis complement fixation test in cattle was not as reliable as the subcutaneous tuberculin test, is not practical for general diagnostic purposes and at best may be employed as a supplementary test in cases of doubtful or atypical reactions to the subcutaneous or other tuberculin tests.

In our work we had not progressed very far when it became apparent that complement fixation in tuberculosis of the lower

¹Series of thirty-two papers by Kolmer *et al* published in the Amer. Jour. of Syphilis, beginning 1919, 3, 1.

²Kolmer, J. A. Amer. Jour. Syph., 1922, 6, No. 1.

³Bach, F. V., Systematische Untersuchungen über die Branchbarkeit der Komplement-bindungsmethode für Serundiagnose der Tuberkulose des Rindes. Inag. Diss., 1909, Leipzig.

⁴Christian, M. and Rosenblatt, S. Münch. Med. Wchn., 1908, 55, 2032.

⁵Porter, A. E., Jour. Hyg., 1911, 5, 105.

⁶Wysehelewsky, S. Ztsch. f. Tuberkulose, 1912, 19, 209.

⁷Hammer, Deutsch. Tierärztl. Wchn., 1912, 20, 593.

⁸Bierbaum, K. and Berdel, G. Ztsch. f. Immunitätsf., orig. 1914, 21, 249.

⁹Jour. Agricult. Research, 1917, 8, No. 1.

animals offered problems for solution somewhat different from those encountered in human tuberculosis. The most important of these concerned the occurrence of positive reactions with the sera of apparently healthy tuberculin negative cattle showing no lesions of tuberculosis in post mortem examinations. These reactions have proven very disturbing and a study of their nature and mechanism of fundamental importance.

PURPOSES OF INVESTIGATION

The purpose of this part of our investigations was to determine the nature and mechanism of these reactions and the results are summarized in this communication.

We have found that these reactions were in part specific and in part non specific, the former being apparently due to the presence of natural complement fixing antibodies removable from sera by absorption with tubercle bacilli, and the latter being greatly influenced by the method employed for the inactivation of serum, the amount of serum used in the tests and to some extent by the kind of primary incubation employed.

TECHNIC

As previously stated the technic employed in all of this work was the new complement fixation test described by one of us (J. A. K.) for syphilis. A complete description of this method is available elsewhere² and only the essential principles need be here stated.

(a) An antisheep hemolytic system was employed, the washed corpuscles being used in dose of 0.5 cc of a 2 per cent suspension. The rabbit antisheep hemolysin was titrated each day and employed in the complement and antigen titrations and main tests in dose of two units.

(b) The complement was a mixture of guinea pig sera collected and prepared in a special manner and titrated each day in the presence of the dose of tuberculosis antigen, this being an important principle adopted for a standardized Wassermann reaction. The complement was employed in the antigen titration and main tests in a dose of two units.

Of considerable importance in this connection is the possibility of guinea pig sera containing complement fixing substances for tuberculosis antigen. Some workers believe that it is necessary to test the complement sera for these before the serum may be employed. In a special study of the subject by one of us (J. A. K.) it was found that occasionally the serum of a guinea pig is found to yield slight degrees of complement fixation with some tuberculosis antigens, but by using a mixture of guinea pig sera and titrating the serum in the presence of the antigen, this factor is satisfactorily adjusted.

(c) One kind of antigen was employed throughout being prepared of washed, dried and pulverized bovine tubercle bacilli suspended in water in the proportion of 0.1 gm. in 18 cc followed by boiling with a reflux condenser for one hour and the addition of 2 cc of 10 per cent sodium chloride in water to render isotonic and 0.25 per cent phenol or tricresol.

The antigens were titrated at frequent intervals for anticomplementary activity and employed in the main tests in a dose equivalent to $\frac{1}{2}$ or $\frac{1}{4}$ the anti-complementary unit with varying amounts of serum or the antigen was

²Kolmer, J. A. Amer. Jour. Syph., 1922, 6, No. 1.

used in doses of $\frac{1}{8}$, $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$, etc., anti-complimentary units with a constant or fixed dose of serum.

(d) After the primary incubation two units of hemolysin and the corpuscles were added to all tubes and the secondary incubation conducted in a water bath for one hour, the results being read an hour or two later after partial settling of the non hemolyzed cells.

(e) The usual serum, antigen, hemolytic system and corpuscle controls were included in each experiment.

(f) Various methods of heating the sera and conducting the primary incubation were employed, a study of these constituting one of the special objects of this investigation.

PART ONE

THE INFLUENCE OF HEATING CATTLE SERA UPON THE TUBERCULOSIS COMPLEMENT FIXATION TEST

In conducting complement fixation tests it is generally necessary to heat the sera for three main purposes:

(a) To inactivate negative complement;

(b) To destroy native thermolabile antisheep hemolysin, if the latter is present and,

(c) To remove thermolabile anticomplementary substances if these have developed in older sera.

For these purposes sera are generally heated at 55 to 58°C. for thirty minutes. Unfortunately this exposure also destroys a portion of specific complement fixing antibody and for this reason Kolmer adopted a method of heating human sera at 55°C. for 15 minutes as sufficient for the above purposes with a minimum destruction of antibody, inasmuch as experience has shown that it is neither entirely safe nor practical under ordinary routine conditions to use unheated sera.

Animal sera however, behave in a very different manner from human sera when heated at 55°C. While heating for 15 minutes at this temperature has been found eminently satisfactory for human sera it is very unsatisfactory for cattle sera because it greatly increases the percentage of non specific reactions.

This very important influence of heat upon animal sera insofar as complement fixation is concerned, has not attracted the attention it deserves and the majority of investigators have overlooked it entirely. Michaelis¹⁰ was probably first to observe that heated normal rabbit sera may yield positive Wassermann reactions and additional investigations by Schelling and Hoeslin¹¹ Manwaring¹², Brown and McKenzie¹³, Kolmer and Casselman¹⁴ and Kolmer and Trist¹⁵ have amply proven that this occurs, the

¹⁰Michaelis, D. Berl. klin. Wchn., 1907, 44, 1103.

¹¹Schelling, C. and Hoeslin, Deut. Med. Wchn., 1908, 34, 1422.

¹²Manwaring, W. H. Ztsch. f. Immunitätsf., orig. 1909, 3, 309.

¹³Browning, C. H. and McKenzie, I. Jour. Path. and Bacteriol., 1911, 15, 182.

¹⁴Kolmer, J. A. and Casselman, A. J., Jour. Med. Research, 1913, 28, 369.

¹⁵Kolmer, J. A. and Trist, M. E., Jour. Infect. Dis., 1916, 18, 46.

latter investigators showing that normal rabbit serum is even more likely to fix complement in a non specific manner with bacterial antigens than with the lipoidal extracts employed in the Wassermann test. Kolmer and Pearce¹⁶ have also shown that the phenomenon occurs with normal dog sera and one of us (F. B.) has noted the occurrence of these non specific reactions with mule and cattle sera heated at 55°C.

Table 1 gives a summary of the results of our complement fixation tests with the sera of calves, adult cattle, sheep and horses in relation to the influence of heating. The cattle sera were from animals in accredited herds yielding negative tuberculin reactions and clinically free of tuberculosis; the sera from the calves and sheep were from slaughtered animals apparently free of anatomic tubercles and the horse sera were from apparently healthy animals.

TABLE 1.—THE INFLUENCE OF HEATING SERA FROM NON TUBERCULOUS ANIMALS UPON THE RESULTS OF TUBERCULOSIS COMPLEMENT FIXATION REACTIONS.*

Animal Sera	Number Tested	Percentage Positive Reactions		
		Heated at 55°C. 15 min.	Heated at 55°C. 30 min.	Heated at 60°C. 30 min
Adult Cattle.....	58	29%	66%	17%
Calves.....	94	11%	14%	6%
Sheep.....	40	9%	12%	5%
Horses.....	17	53%	Not tested	1—2%

*Primary incubation one hour at 38°C; antigen employed in dose of $\frac{1}{4}$ anticomplementary unit. Serum dose 0.1 cc

As shown in this table heating sera at 55°C. for 30 minutes yields the largest number of these reactions. Probably not all of these reactions are non specific; indeed, we shall shortly present evidence indicating that some and particularly those yielding positive reactions when the sera were heated at 60°C. were probably specific and due to tuberculosis amboceptors removable from the sera by absorption with tubercle bacilli.

The results indicate however, that *the temperature employed for the inactivation of sera of clinically non tuberculous animals has a very important influence upon the occurrence of complement fixation reactions; with the sera of cattle, sheep and horses a temperature of at least 60°C. is required for 30 minutes in order to remove or reduce the incidence of non specific reactions, as previously stated the same has been found true of the sera of rabbits, dogs and mules.*

¹⁶Kolmer, J. A. and Pearce, R. M. Jour. Infect. Dis., 1916, 18, 32.

The nature of the changes occurring in animal sera as a result of heating at 55°C. responsible for these non specific reactions, is not definitely known. Probably it is one of colloidal change. Coccidiosis has been believed by some investigators responsible for the phenomenon in rabbits, but this has been disproven by Kolmer and Trist and others. Kolmer¹⁷ has shown that with rabbit sera both the serum lipoids and proteins are concerned in the process; sera extracted with ether and chloroform were found less fixable and these results have been confirmed by one of us (F. B.) Furthermore the reactions are not due to the summation of the anticomplementary activities of serum and antigen; even perfectly fresh sera free of anticomplementary activity produce these reactions but to a lesser extent than heated sera. The kind of antigen employed is likewise a modifying factor; for example, antigen of *B. abortus* (Bang) are apparently less apt to yield these reactions than tuberculosis antigens and old antigens of either produce less reactions than fresh antigens.

PART TWO

THE INFLUENCE OF THE METHOD OF PRIMARY INCUBATION UPON THE SPECIFIC AND NON SPECIFIC TUBERCULOSIS COMPLEMENT FIXATION TEST WITH CATTLE SERA

The usual practice in conducting complement fixation tests in veterinary laboratories is to employ a primary period of incubation of antigen, serum and complement of one hour at 37-38°C. in a water bath or thermostat. In the complement fixation test for syphilis the same practice is followed by many serologists but a constantly growing custom is to use a period of 4 to 18 hours at 8-10°C. and Kolmer has adopted for his new complement fixation test, an incubation of 18 hours at 8°C. followed by 10 minutes in a water bath at 38°C., this technic having proven superior to all other methods in an extensive series of experiments.¹⁸

The temperature and duration of primary incubation influences the results of complement fixation tests in three important particulars:

- (a) The degree of complement destruction;
- (b) The degree of complement fixed or absorbed by antigen alone and serum alone and

¹⁷Kolmer, J. A., *Jour. Infect. Dis.*, 1916, 18, 46.

¹⁸Kolmer, J. A. *et al.*, *Amer. Jour. Syph.*, 1920, 4, 675; *ibid.*, 1921, 5, 30; *ibid.*, 1921, 5, 44; *ibid.*, 1921, 5, 63.

(c) The amount of complement fixed or absorbed by mixtures of serum and antigen in the conduct of complement fixation tests.

In a broad and general manner a primary incubation of one hour in a water bath at 38°C. results in slightly greater complement destruction and slightly greater fixation by antigen alone, serum alone and mixtures of these than occurs during one hour in a thermostat. Likewise an incubation of two hours in a water bath results in considerable more complement deterioration and fixation by antigen alone and serum alone than occurs during one hour and slightly more fixation by mixtures of serum and antigen. At 8 to 10°C. for 18 hours there is slightly more complement destruction than occurs during one hour at 38°C. and for this reason the hemolytic system must be adjusted for this kind of primary incubation for satisfactory results, experience having shown that a system yielding good results with warm incubation may be unsatisfactory for the cold method. Furthermore there is considerably more complement fixed or absorbed at 8°C. for 18 hours by antigen alone and serum alone than occurs during one hour at 38°C. For this reason the antigen must be titrated at this temperature because the anticomplementary unit obtained after the cold method of primary incubation is invariably higher than the unit after warm incubation. This greater non specific fixation of complement by antigen and serum alone in the cold method of incubation renders non specific reactions more likely unless accounted for in the adjustment of the hemolytic system, as has been accomplished by Kolmer insofar as tests with human sera are concerned.

In addition however, numerous experiments have shown that a primary incubation of 18 hours at 8°C. also results in a greater degree of specific fixation by mixtures of serum and antigen. This has been found undoubtedly true by Kolmer in tests employing human serum in the Wassermann syphilis tests and likewise in the gonococcus, typhoid and other bacterial complement fixation tests.

In tuberculosis complement fixation tests, however, the evidence is less clear and decisive, and if an incubation of 18 hours at 8°C. is superior, the differences insofar as specific reactions are concerned, are slight.

In these studies three kinds of primary incubation of serum, antigen and complement were employed:

One hour in a water bath at 38°C.

Two hours in a water bath at 38°C.

Eighteen hours in a refrigerator at 8°C.

The results observed in comparative tests are shown in tables 2 and 3.

TABLE 2.—THE INFLUENCE OF TEMPERATURE AND DURATION OF PRIMARY INCUBATION UPON TUBERCULOSIS COMPLEMENT FIXATION TESTS WITH THE SERA OF CLINICALLY NON TUBERCULOUS ANIMALS

Animal Sera	Positive Reactions with Primary Incubation:		
	Water Bath 1 hr. 38°C.	Water Bath 2 hrs. 38°C.	Refrigerator 18 hrs. 8°C.
Adult Cattle.....	17%	31%	32%
Calves*.....	6%	—	6%
Sheep*.....	5%	—	25%
Horses†.....	53%	—	92%

*Sera used in dose of 0.1 cc. with $\frac{1}{4}$ anticomplementary unit of antigen. Sera heated at 60°C. for $\frac{1}{2}$ hour.

†These sera were heated at 55°C. for 15 min. which largely accounts for the large number of positive reactions.

TABLE 3.—THE INFLUENCE OF TEMPERATURE AND DURATION OF PRIMARY INCUBATION UPON COMPLEMENT FIXATION REACTIONS WITH THE SERA OF TUBERCULOUS CATTLE (TUBERCULIN REACTORS OR LESIONS FOUND AT NECROPSY).*

Sera	Positive Reactions with Primary Incubation		
	Water Bath 1 hr. 38°C.	Water Bath 2 hrs. 38°C.	Refrigerator 18 hrs. 8°C.
11	10%	—	20%
35†	75%	86%	94%
23†	14%	—	100%

*All sera used in dose of 0.1 cc. with $\frac{1}{4}$ anticomplementary unit of antigen. Sera heated at 60°C. for $\frac{1}{2}$ hour.

†Sera heated at 55°C. for 15 minutes (therefore probably includes some non specific reactions).

As shown in table 2 a primary incubation of 2 hours at 38°C. in a water bath greatly increases the percentage of apparent non specific reactions and the refrigerator incubation of 18 hours gives still more of these reactions. Not all of these reactions however, are non specific as will be shown in our second paper.

As shown in table 3 a warm incubation of 38°C. for 2 hours and a cold incubation of 18 hours also increases very materially the percentage of positive reactions observed with the sera of tuberculin reacting cattle and cattle showing the lesions of tuberculosis when examined post mortem. We believe that the cold incubation increases the degree of specific fixation to an extent somewhat greater than it influences non specific fixation, but not nearly so much as it influences the Wassermann reaction with human sera and lipoidal extracts.

As shown in table 3 the influence of the temperature and duration of primary incubation upon non specific complement fixation was shown with the sera of apparently non tuberculous

cattle, calves, sheep and horses; for testing the influence upon reactions with the sera of tuberculous animals only adult cattle were available. We believe that the somewhat greater degree of specific complement fixation at 8°C. for 18 hours offsets the disadvantage of greater non specific fixation providing the tests are conducted with smaller amounts of serum in order to avoid non specific reactions.

The results shown in tables 2 and 3 were tests conducted with 0.1 cc serum. Table 4 shows the influence of using smaller amounts of serum for avoiding non specific reactions with the sera of apparently non tuberculous animals.

TABLE 4—THE INFLUENCE OF AMOUNT OF SERUM EMPLOYED UPON THE PERCENTAGE OF POSITIVE NON SPECIFIC TUBERCULOSIS COMPLEMENT FIXATION TESTS

Sera	Prim. Incub.: 1 hr. 38° C.				Prim. Incub.: 18 hrs. 8° C.			
	0.1 cc	0.05 cc	0.025 cc	0.0125 cc	0.1 cc	0.05 cc	0.025 cc	0.0125 cc
Adult cattle....	17%	3%	0	0	21%	0	0	0
Calves.....	6%	2%	0	0	6%	2%	0	0
Sheep.....	5%	2%	0	0	25%	12%	0	0

As shown in table 4 sera used in dose of 0.025 cc did not yield non specific reactions; this figure agrees very closely with that found by Kolmer for normal rabbit serum when tested with his new complement fixation test.

It is to be remembered in this connection that the complement in these tests was used in dilution of 1:30; with complement 1:10 the tendency for non specific reactions would be less, likewise the sensitiveness of the specific test would be reduced. All figures expressing percentages in this paper are based therefore, upon the particular technic employed and may not (and probably would not) correspond to figures obtained with other methods. But we believe that the following conclusions are generally applicable:

CONCLUSIONS

1. The method of heating (inactivating) sera of the lower animals for complement fixation tests has considerable influence upon the reactions.

2. Heating sera in a water bath at 55°C. for 15 minutes increases the percentage of non specific reactions yielded by the sera of adult cattle, calves, sheep and horses in tuberculosis complement fixation tests.

3. Heating the sera of these animals at 55°C. for 30 minutes increases still more the percentage of non specific tuberculosis complement fixation tests.

4. Heating sera at 60°C. for 30 minutes greatly reduces the percentage of non specific reactions and is the method of choice for preparing the sera of cattle and other of the lower animals for complement fixation tests.

5. Raw or unheated sera are less likely to yield non specific reactions than sera heated at 55°C. but not appreciably less active in this respect than sera heated at 60°C.

6. The temperature and degree of the primary incubation has considerable influence upon the occurrence of non specific and specific tuberculosis complement fixation tests.

7. A primary incubation of 18 hours at 8°C. increases the amount of complement destruction, the amount of complement fixed by antigen alone and serum alone as well as the amount specifically fixed by mixtures of serum and antigen.

8. The method of cold primary incubation of 18 hours at 8°C. is probably preferable to a water bath incubation of one hour at 38°C. but requires the use of smaller amounts of serum for avoiding non specific reactions.

9. With the technic employed in these tests sera used in dose of 0.025 cc do not yield non specific reactions; these amounts may however, yield specific reactions as will be shown in a succeeding report.

II. THE OCCURRENCE OF SPECIFIC TUBERCULOSIS COMPLEMENT FIXING SUBSTANCES IN THE SERA OF TUBERCULIN NEGATIVE CATTLE.

In the tuberculosis complement fixation test with the sera of cattle, the occurrence of positive reactions with the sera of apparently healthy animals yielding negative tuberculin reactions, proves very disturbing and materially reduces the practical diagnostic value of the reaction. Reactions of a similar kind sometimes occur with human sera, that is, when there is no clinical evidence of tuberculosis but in the experience of one of us (J.A.K.) these reactions are much less common than met with among cattle.

Porter¹, Wyschelewsky² and others have reported positive reactions with the sera of apparently normal animals; Eichhorn and Blumberg³ noted their occurrence with 45 or about 14 per

¹Porter, A. E. The precipitin, complement-binding and antipsonic tests in tuberculosis and normal cattle. *Jour. Hyg.*, 1911, 5, 105.

²Wyschelewsky, S. Beiträge zur Unterscheidung der aktiven und inaktiven Tuberkulose des Rindes mit Hilfe der Komplementbindung, Meistagmin und ophthalmoreaktion. *Ztsch. f. Tuberk.*, 1912, 19, 209.

³Eichhorn, A. and Blumberg, A. Diagnosis of Tuberculosis by Complement Fixation, with Special Reference to Bovine Tuberculosis. *Jour. Agricult. Research*, 1917, 8, No. 1.

cent of a series of 320 sera from animals without lesions and negative to the tuberculin test.

The nature and mechanism of these reactions have not attracted as much attention as their practical and theoretical importance demands. Eichhorn and Blumberg have suggested that the reactions in cattle may be due to the prior injection of tuberculin. They injected two healthy young cattle yielding negative complement fixation reactions, with 2 cc of tuberculin subcutaneously and found that the reactions became positive on the fourth day and strongly positive on the tenth day after injection. This condition persisted for four weeks followed by partial fixation and complete disappearance after six weeks.

In the first part of this paper we have shown that positive reactions with the sera of apparently normal cattle yielding negative tuberculin reactions and showing no lesions of tuberculosis in necropsies, may be due to the commonly employed method of inactivating sera by heating at 55°C.; also that the method of primary incubation employed may favor their occurrence unless smaller amounts of serum are employed in the tests than is commonly practiced. These reactions are apparently non specific and due to some changes in the colloidal reactions of the serum and antigen responsible for the fixation of complement.

But even after these purely non specific factors have been satisfactorily adjusted as they readily may be by technical procedures, a small percentage of sera of adult cattle continue to give positive reactions.

In this connection it is rather significant that the sera of non tuberculous calves almost invariably yield negative reactions. In one series of 60 sera we did not observe a single positive reaction when the sera were heated at 60°C. for 30 minutes and tested with a warm primary incubation; in duplicate tests with these same sera employing cold primary incubation, positive reactions occurred in but three sera, and these were very weakly positive.

This suggests that the reactions with cattle sera are due to acquired tuberculosis complement fixing antibodies either as a result of small latent foci producing insufficient allergic sensitization for yielding tuberculin reactions and escaping detection at necropsy, or as a result of tuberculin injections, as suggested by Eichhorn and Blumberg.

The latter assumption is strongly supported by Eichhorn's and Blumberg's experiment quoted above, although we have found that the sera of rabbits injected with tuberculin subcu-

taneously and intravenously do not show specific complement fixing properties with antigens of tuberculin and tubercle bacilli, until a large number of injections of very large doses over four or more weeks, have been given. Repeated subcutaneous injections of tuberculin in amounts equivalent in body weight to the dose usually given cattle for the tuberculin test always yielded negative results. While these results were observed with rabbits, they do not however, necessarily apply to cattle which may react to tuberculin with the production of specific complement fixing antibodies more readily. Indeed, the high percentage of cattle showing these specific reactions in the absence of clinical tuberculosis and the results of Eichhorn's and Blumberg's experiment render this assumption worthy of careful consideration.

All of these reactions in our work occurred with the sera of cattle which had received two or more injections of tuberculin some time prior (4 to 12 months) to the complement fixation tests. Table 5 gives a summary of the results of tests with 162 cattle regarded clinically as non tuberculous and yielding negative tuberculin reactions (subcutaneous injection). As shown in this table, 6 per cent of the sera yielded positive reactions in tests employing 0.05 cc serum and a warm primary incubation; 15 percent reacted positively in tests employing 0.025 cc serum and a cold incubation of 18 hours at 8°C. We believe that the majority of these positive reactions under these circumstances bore some relation to the injections of tuberculin.

As shown in this table the majority of these reactions were weakly positive (+ + or +).

TABLE 5—RESULTS OF TUBERCULOSIS COMPLEMENT FIXATION TESTS WITH THE SERA OF 150 CATTLE CLINICALLY NON TUBERCULOUS AND YIELDING NEGATIVE TUBERCULIN REACTIONS*

Reactions	Water Bath: 1 hr. 38°C.			Refrig. 18 hrs. 8°C.		
	0.05	0.025	0.0125	0.05	0.025	0.0125
+ + + +	0	0	0	6%	1%	0
+ + +	0	0	0	5%	4%	0
+ +	3%	0	0	5%	5%	2%
+	3%	0	0	9%	5%	3%
—	95%	100%	100%	75%	85%	95%
% positive	5%	0	0	25%	15%	5%

*All animals had received two or four injections of tuberculin four months or more before these tests.

Table 6 summarizes the results of additional tests with the sera of 63 cattle, all of which had received two or more injections

of tuberculin, the last from 4 to 12 months prior to the complement fixation tests. The percentage of positive reactions among this group of tuberculin negative cattle is higher than shown in table 1, but this is due to the fact that the tests were conducted with 0.1 cc instead of 0.05 cc serum and for this reason may include some non specific reactions.

TABLE 6—THE RELATION OF INJECTIONS OF TUBERCULIN TO THE OCCURRENCE OF TUBERCULOSIS COMPLEMENT FIXATION REACTIONS WITH THE SERA OF TUBERCULIN NEGATIVE CATTLE

Tuberculin Tests*	Months Since Last Test	Total Tested	Method Heating Sera	Positive Fixation Reactions
1st Test 4/1920; 2nd Test 1/1921.....	about 12	18	55°C. 30 min.	27%
1st Test 2/1919; 2nd 8/1919; 3rd 8/1920; 4th 8/1921.....	about 6	18	60°C. 30 min.	6%
1st Test 11/1919; 2nd 11/1920; 3rd 11/1921....	about 4	27	60°C. 30 min.	22%

*All tests conducted with 0.1 cc. serum and primary incubation of one hour at 38°C.

That these positive reactions are caused by the presence of specific antibodies, when precautions are taken against the occurrence of non specific reactions, and may bear a relation to the injection of tuberculin is indicated by the results of our absorption tests. Sera yielding these reactions were treated with a sufficient number of washed dead tubercle bacilli to render the serum distinctly cloudy. These mixtures were then placed in a refrigerator at 8°C. over night followed by two hours in an incubator at 38°C. and very thorough centrifuging. The super-

TABLE 7—THE INFLUENCE OF ABSORBING CATTLE SERA WITH TUBERCLE BACILLI UPON TUBERCULOUS COMPLEMENT FIXATION TESTS*

Plain Sera						Absorbed Sera					
0.1	0.05	0.025	0.0125	0.006	Control	0.1	0.05	0.025	0.0125	0.006	Control
4†	3	2	—	—	—	2	—	—	—	—	—
1	—	—	—	—	—	—	—	—	—	—	—
4	4	3	—	—	—	—	—	—	—	—	—
2	1	—	—	—	—	—	—	—	—	—	—
4	3	2	—	—	—	—	—	—	—	—	—
3	2	—	—	—	—	—	—	—	—	—	—
2	1	—	—	—	—	1	—	—	—	—	—
4	4	3	—	—	—	2	—	—	—	—	—
4	4	2	—	—	—	—	—	—	—	—	—
2	2	1	—	—	—	—	—	—	—	—	—
2	—	—	—	—	—	—	—	—	—	—	—
1	—	—	—	—	—	—	—	—	—	—	—

*Primary incubation 18 hours at 8°C.

†4 = + + + +; 3 = + + +; 2 = + +; etc.

natant and clear sera were then heated at 60°C. for 30 minutes and retested. Table 7 gives a summary of the results observed with 12 positively reacting sera, as examples of a large series. All of these tests were conducted with a primary incubation of 18 hours at 8°C. in order to accentuate the results.

As shown in table 7, treatment of these sera with tubercle bacilli resulted in the complete or nearly complete removal of the substance responsible for the positive reactions. Under those circumstances it is reasonable to assume that these substances were specific tuberculosis amboceptors. Treatment of sera with tubercle bacilli does not remove the non specific substances responsible for positive reactions as a result of heating at 55°C. in other words, absorption with tubercle bacilli does not remove the non specific substances.

CONCLUSIONS

1. The sera of 6 to 15 per cent of tuberculin negative cattle may show weakly positive but specific tuberculosis complement fixation tests.

2. These reactions are not caused primarily by non specific factors as result from heating sera at 55°C., temperature and duration of primary incubation, etc.

3. The substance in cattle sera responsible for these reactions is usually removable in whole or part by prolonged absorption of the sera with washed tubercle bacilli. This indicates their specific amboceptor nature.

4. These amboceptors are not usually present in the sera of calves.

5. It is possible that these tuberculosis amboceptors are present in the sera of cattle as natural amboceptors; or they are produced as the result of injections of tuberculin; or possibly but not probably, they are produced by small, undetectable foci of latent tuberculosis.

6. The occurrence of these "normal" but specific reactions very much reduces the practical application of the complement fixation test in the diagnosis of tuberculosis in cattle.

III. THE DIAGNOSTIC VALUE OF THE COMPLEMENT FIXATION TEST IN BOVINE TUBERCULOSIS.

Having shown in the first part of this paper that purely non-specific reactions occurring in tuberculosis complement fixation tests with the sera of cattle may be avoided by careful attention to technical details, of which the proper adjustment of the

hemolytic system, the titration and dose of antigen, and inactivation of serum by heating at 60°C. instead of 55°C. for thirty minutes are important, it remains to determine the occurrence and diagnostic value of the specific reaction. The temperature and duration of primary incubation are also important in relation to non specific reactions and with the method employed in these studies, it was found advisable to use cattle sera in dose of 0.05 cc or less for diagnostic reactions when a primary incubation of 1 hour in a water bath was employed, and not more than 0.025 cc or less when an incubation of 18 hours at 8°C. was employed.

However, as shown in the second part of this paper, even these amounts of serum tested under these conditions will still yield from 6 to 15 per cent positive reactions; these reactions were only weakly positive, but apparently specific, and appeared to bear some relation to the subcutaneous injection of tuberculin, or possibly to the presence of small and latent foci of tuberculosis.

PURPOSE OF INVESTIGATION

In this part of our investigation we have examined the sera of tuberculin reactors and of cattle showing lesions of tuberculosis when examined at necropsies. We have aimed to avoid the non-specific reactions, and have sought to determine if by serum dilutions it was possible to differentiate between cattle frankly tuberculous and those clinically free of tuberculosis and yielding negative tuberculin reactions, but which may yield the "normal" or "tuberculin" specific complement fixation reaction.

REVIEW OF LITERATURE

Porter¹ found that complement fixation reactions were stronger with the sera of cattle in the advanced stages of tuberculosis than with the sera of normal cattle and animals in the early stages of the disease. Wyschelewsky² was not able to differentiate the latent from the more progressive cases. Hammer³ observed 50 positive and 46 negative reactions in a series of 96 cases, of which 48 were found to show tuberculous lesions on necropsy examination. Bierbaum and Berdel⁴, however, were unable to confirm these results. Eichhorn and Blumberg⁵ employing

¹Porter, A. E. The precipitin, complement binding, and antipsonic tests in tuberculosis and normal cattle. Jour. Hyg., 1911, 5, 105.

²Wyschelewsky, S. Beitrag zur Unterscheidung der aktiven und inaktiven Tuberkulose des Rindes mit Hilfe Komplementbindung, Meiotagmin, und Ophthalmoreaktion. Ztsch. Tuberkulose, 1912, 19, 203.

³Hammer. Die Serodiagnose der Rindertuberkulose. Deut. Tierärztl. Wehn... 1912, 20, 539

⁴Bierbaum, K. and Berdel, G. Die Diagnose der Rindertuberkulose mittels der Komplementbindungsreaktion nach der Methode von Hammer. Zts. h. f. Immunitätsf., orig., 1914, 21, 249.

⁵Eichhorn, A. and Blumberg, A. Diagnosis of tuberculosis by complement fixation, with special reference to bovine tuberculosis. Jour. Agricult. Research, 1917, 8, No. 1.

antigens of tuberculin, emulsion of tubercle bacilli, and extracts of tuberculous tissues obtained 81.6 per cent accurate reactions, which they regard as insufficient for rendering the complement fixation test a practical means for the diagnosis and control of the disease.

ANTIGEN AND TECHNIC EMPLOYED

The kind of antigen employed in tuberculosis complement fixation tests is known to exert a very important influence upon the results. After extensive comparative tests of a large number of antigens prepared by different methods (Besredka's, Miller's, Wilson's, Petroff's, Fleischer's, etc.) Kolmer found that the best method was a slight modification of one of Petroff's antigens, which was described in the first paper of this series, and consists essentially of a suspension of thoroughly pulverized bacilli.

It did not appear to matter whether the antigen was prepared of human or bovine bacilli, although all of the work reported upon in this communication was conducted with antigens of bovine bacilli.

The technic of the complement fixation tests was that of Kolmer's new complement fixation test for syphilis previously outlined. When a water bath primary incubation was employed, the antigen was titrated by the same and employed in a fraction of the anti-complementary unit (usually $\frac{1}{3}$ or $\frac{1}{4}$). When a cold primary incubation was employed, the antigen was titrated by the same method, which is a matter of considerable technical importance.

RESULTS

The results of complement fixation tests with the sera of 220 cattle are summarized in tables 1, 2, and 3. These tables show the percentage of + + + +, + + +, + +, +, and negative reactions observed with 0.1, 0.05 and 0.025 cc of sera in tests conducted with a water bath incubation of one hour and duplicate tests with a primary incubation of 18 hours at 8° C.

Table 8 summarizes the results observed with the sera of 162 clinically non-tuberculous and tuberculin negative cattle; some of the positive reactions were probably due to the presence of natural amboceptors, to the tuberculin injections or possibly, small undiscovered and latent foci. This is particularly true of the 6 per cent positive reactions observed with 0.05 cc amounts

TABLE 8—RESULTS OF TUBERCULOSIS COMPLEMENT FIXATION TESTS WITH 162 SERA OF CLINICALLY NON-TUBERCULOUS AND TUBERCULIN NEGATIVE CATTLE

Reactions	Water Bath: 1 hr. 38°C.			Refrig. 18 hrs. 8°C.		
	0.1	0.05	0.025	0.1	0.05	0.025
+ + + +	2%	0	0	12%	7%	3%
+ + +	4%	0	0	5%	4%	4%
+ +	2%	3%	0	8%	6%	3%
+	7%	3%	0	10%	8%	5%
	85%	94%	100%	65%	75%	85%
% positive	15%	6%	0	35%	25%	15%

of serum with warm incubation and the 15 per cent positive reactions with 0.025 cc serum and cold incubation. With the larger amounts of serum in both methods, it is highly probable that some of the positive reactions may have been non-specific, as some of the sera had been heated at 55° C. instead of 60° C.

Table 9 summarizes the results observed with the sera of 29 cattle yielding positive tuberculin reactions and regarded clinically as tuberculous, although necropsies were not conducted on this group. The positive reactions were probably due primarily to the existence of active lesions, and secondarily to tuberculin injections or natural amboceptors.

TABLE 9—RESULTS OF TUBERCULOSIS COMPLEMENT FIXATION TESTS WITH 29 SERA OF TUBERCULIN POSITIVE CATTLE (NO NECROPSIES)

Reactions	Water Bath: 1 hr. 38°C.			Refrig. 18 hrs. 8°C.		
	0.1	0.05	0.025	0.1	0.05	0.025
++++	8%	0	0	12%	10%	0
+++	2%	3%	0	10%	4%	7%
++	10%	7%	0	13%	10%	4%
+	5%	5%	5%	40%	26%	14%
--	75%	85%	95%	25%	50%	75%
% positive	25%	15%	5%	75%	50%	25%

Table 10 summarizes the results observed with the sera of 39 cattle regarded clinically as tuberculous, yielding positive tuberculin reactions and showing tuberculous lesions at necropsies.

TABLE 10—RESULTS OF TUBERCULOSIS COMPLEMENT FIXATION TESTS WITH 39 SERA OF TUBERCULOUS CATTLE (NECROPSIES).

Reactions	Water Bath: 1 hr. 38°C.			Refrig. 18 hrs. 8°C.		
	0.1	0.05	0.025	0.1	0.05	0.025
++++	31%	10%	0	66%	56%	36%
+++	5%	15%	3%	5%	10%	15%
++	10%	8%	8%	1%	3%	12%
+	14%	17%	14%	3%	3%	9%
--	40%	50%	75%	25%	28%	28%
% positive	60%	50%	25%	75%	72%	72%

As previously stated, we believe that *with the technic employed in this study, the results of specific positive complement fixation reactions due to foci of tuberculosis should be based upon tests conducted with not more than 0.05 cc of serum heated at 60°C. for 30 minutes when a water bath incubation of 1 hour is employed, and*

with not more than 0.025 cc of serum heated at 60°C. for 30 minutes when a refrigerator incubation of 18 hours at 8°C. is employed. Under these conditions purely non specific reactions are avoidable with our technic and the specific reactions due to natural tuberculosis amboceptors, to tuberculin injections or possibly, to very small and latent foci of tuberculosis are reduced to 6 to 15 per cent.

Among cattle yielding positive tuberculin reactions as met with in herds of dairy cows, positive reactions occurred under these conditions in:

- (a) 15 per cent by water bath incubation and,
- (b) 50 per cent by refrigerator incubation.

Among cattle frankly tuberculous yielding positive tuberculin reactions and showing tuberculous lesions when examined post mortem, positive reactions occurred under these conditions in:

- (a) 50 per cent by water bath in incubation and,
- (b) 72 per cent by refrigeration incubation.

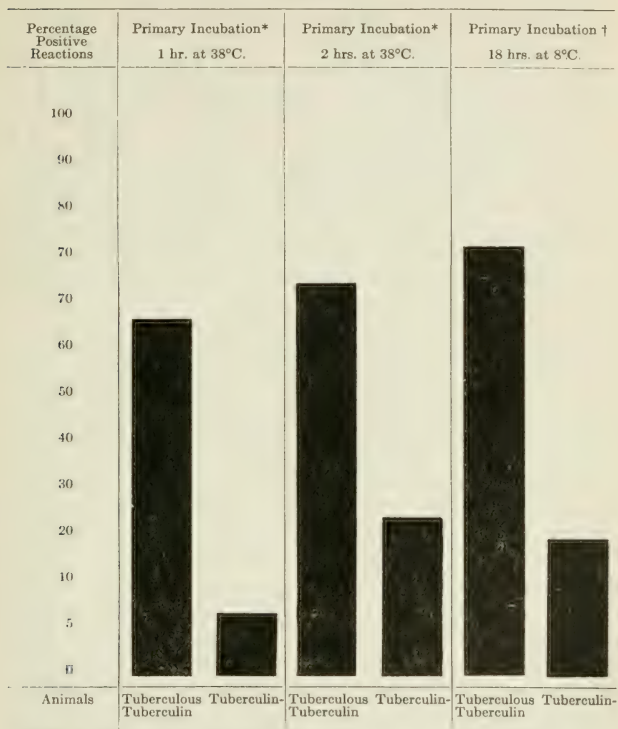
These results are shown graphically in chart 1.

Our percentage of positive reactions with the sera of tuberculous cattle (50 per cent) was, therefore, considerably less than that reported by Eichhorn and Blumberg (81.6 per cent); but their tests were conducted with 0.2 cc of serum heated at 58°C. for thirty minutes and very probably included some non-specific reactions. The slight superiority of prolonged refrigerator incubation is shown by the higher percentage of positive reactions (72 per cent) in our series, even though it was necessary to use not more than 0.025 cc of serum in order to remove or reduce the chances of securing non-specific reactions.

Under these conditions, however, a certain number of reactions are lost; that is, positive specific reactions which would otherwise occur if the sera were employed in the larger amounts. The purely non-specific, tuberculin specific, and tuberculosis specific reactions grade from one to the other so gradually that when sera are heated at 60°C. for thirty minutes and used in amounts of 0.05 cc or less for the purpose of preventing positive reactions due to non-specific factors and tuberculin, it leaves only 50 to 72 per cent reactions in tuberculosis, and these percentages are too small for rendering the complement fixation test of practical value. For these reasons the complement fixation reaction is very much less valuable than the tuberculin reaction, and probably cannot be placed on a practical diagnostic basis.

The chief reason for this is that the tubercle bacillus does not

CHART I.



*Based on tests conducted with 0.05 cc. serum.

†Based on tests conducted with 0.025 cc. serum.

engender the production of large amounts of complement fixing antibodies, although foci of living tubercle bacilli produce an exquisite degree of allergic sensitization. It is a common experience that the immunization of the lower animals with the tuberculins or suspensions of dead and even of living bacilli is followed by very tardy antibody production; and even under the best of conditions, the amounts of various antibodies produced, including those responsible for complement fixation, are never very large—seldom as much, for example, as occurs in glanders of horses and syphilis of human beings. For this reason all attempts

toward developing a system of prophylactic immunization of cattle and human beings by injections of tuberculins and vaccines of tubercle bacilli have failed, except for the slight and temporary resistance produced by the intravenous injection of living bacilli. By reason of this poor antigenic quality of tubercle bacilli and their products, it is not possible to prepare immune sera of proven prophylactic and curative properties for human and bovine tuberculosis.

Living tubercle bacilli in actual foci of disease confer some degree of resistance to re-infection due almost entirely to allergic sensitization of the tissues, the allergic reaction following the re-introduction of tubercle bacilli being the protective mechanism. Very little of this resistance can be ascribed to the presence of specific antibodies.

Failure of the tuberculosis complement fixation reaction is generally ascribed to a lack of antigenic sensitiveness of the antigen or an insufficiently sensitive hemolytic system and general technic. Rather it is due in large part to the failure of the tubercle bacillus to produce sufficient amounts of the complement fixing antibodies. Unpublished experiments by Kolmer and his associates have shown that when rabbits are immunized with equal numbers of glanders, typhoid, and tubercle bacilli, pneumococci, gonococci, streptococci, and other organisms, there is a very marked difference in the production of complement fixing antibodies ascribable entirely to immunological differences in the bacteria, and of these the tubercle bacilli were found among the poorest stimulators of antibody production. These fundamental biological facts are the real basis for the low percentage and generally weak specific complement fixation reactions in tuberculosis. The same applies in equal degree to human tuberculosis, although with human sera the difficulties are less, because non-specific reactions do not occur as a result of heating the sera at 55°C. and tuberculin is not frequently administered.

CONCLUSIONS

1. In the tuberculosis complement fixation test employed in these studies, cattle sera were heated at 60°C. for thirty minutes and employed in dose of 0.05 cc or less to avoid non-specific reactions with a primary incubation of one hour at 38°C., and in dose of 0.025 cc or less, in a primary incubation of 18 hours at 8°C.

2. Under these conditions, specific reactions due to natural

amboceptors, to tuberculin injections or, possibly, to clinically non-detectable lesions of tuberculosis were reduced to 6 to 15 per cent.

3. Among dairy cows yielding positive tuberculin reactions, positive complement fixation reactions occurred with 15 per cent of sera tests conducted with 0.05 cc serum and warm incubation; with 0.025 cc serum and refrigerator incubation, positive reactions occurred with 50 per cent of sera.

4. Among tuberculous cattle yielding positive tuberculin reactions and showing lesions of tuberculosis, positive reactions occurred with 50 per cent of sera in tests employing 0.05 cc serum and a warm incubation; with 0.025 cc of serum and refrigerator incubation, positive reactions occurred with 72 per cent of sera.

5. The sensitiveness of the tuberculosis complement fixation test is highest with freshly prepared antigens; little or no difference was noted with antigens of human and bovine bacilli.

6. The complement fixation reaction is not a practical diagnostic test for tuberculosis of cattle. The chances for error are too great, and the percentage of true specific reactions too small.

7. The fundamental reason for failure of complement fixation in tuberculosis is lack of production of complement fixing antibodies. Living tubercle bacilli engender a very high degree of allergic sensitization, but relatively small amounts of complement fixing and other serum antibodies.

DISCUSSION

CHAIRMAN PICKENS: We are now ready for the discussion on Dr. Boerner's paper.

DR. EICHORN: Mr. Chairman, I think this is of considerable importance, and I am very pleased with the results we have obtained in the experiments conducted five or six years ago. The problem of diagnosing tuberculosis by biological tests is a difficult one, but, nevertheless, I do not think it should discourage those working along this line from continuing their work, inasmuch as there might be a test, perhaps some complement fixation test, not necessarily this one, but it might be another kind of biological test, that could be utilized for diagnosis and would be of considerable importance in the control of this infection of cattle and animals. The difficult thing which confronts us in obtaining results by the complement fixation test in this disease, I think, is due to two factors, one being the complex condition of the tubercle bacillus. As all investigations have proven, we have to deal with an organism much more complicated than the organisms we have in other diseases in animals or human beings. The second thing is the nature of the disease, which we know may exist in the animal, and in the course of time become, by a little change, either arrested or practically disappeared, as far as it was actually concerned.

DR. WATSON: That paper contained a lot of valuable data and interested me greatly, because we are working on somewhat similar lines in testing out the adaptability and value of complement fixation methods in testing tuberculosis. There is just one point which I would like to give my opinion on, and that is the tendency of these failures, if we may call them such, to arise when using a really satisfactory method of complement fixation test, and that

leads us to suppose that the complement fixation test is not applicable. We are apt to make a mistake there in saying the complement fixation test is not practicable, because we don't know enough about the complement fixation test. I believe myself that the complement fixation test will be found applicable, and that the trouble at the present moment is because we haven't got the right way of applying it or we don't know enough about the biological character of tubercle bacilli.

Dr. Boerner spoke of the properties of tubercle bacilli producing antibodies; that, of course, has been noted, generally speaking, but we have found already that a great deal depends upon the way the bacillus has been grown and prepared. We are to some extent successful in sensitizing or immunizing animals to tubercle antigens. The results vary very much; that is, all the way from negative antibody content in certain tuberculin injections up to a fairly strong antibody content. We have experimented with the tuberculin filtrate, with the unheated bouillon filtrate, and they say we have a fair antibody serum; with the unheated bouillon filtrate we have used antigens, tubercle bacilli sensitized with different serums, serums of reactors, serums of animals previously sensitized, increasing the doses, etc. I merely mention these to show that we are hardly justified in saying that the tubercle bacillus is a poor antigen in this thing. It depends on how you employ it. There is an enormous void of knowledge on that point, which we have got to work through before we can say the complement fixation test is not applicable. I myself am much encouraged by the results that are being obtained.

I notice in this paper that but one antigen has been used in this test. There is a possibility, by combining antigens, that there may be one antigen that will pick out tuberculosis in a certain form, and another tubercle antigen might be prepared that will pick out another stage of the disease, etc. There is an indication that possibly by using four or five or even more antigens, we will get a very much higher percent of positive reactors, equal or even superior to the tuberculin test. I am a little bit in favor of the complement fixation method because I don't want to see the work stop, the work of trying to evolve a satisfactory method of testing, which will be the greatest value. If we can get a test by which we can take something out of the animal and not be continually putting something in, we will make a big stride in diagnosing tuberculosis. I hope the work will go on until we have arrived at a satisfactory method for making a complement fixation test.

Plan To Go To Montreal, August 27-31.

SOME FINE NEWSPAPER PUBLICITY

The School of Veterinary Medicine of the University of Pennsylvania recently received some very nice publicity in two Philadelphia newspapers. *The Evening Bulletin*, under date of April 14, carried a half-column write-up and two photographs illustrating the article, on the picture page. These showed views in the equine operating room, with a horse about to be placed on the table, and the other with horse ready to be operated upon by Dr. John W. Adams. *The North American*, under date of May 20, ran an article a full column in length, accompanied by a very fine photograph, taken in the Small Animal Clinic, showing several canine patients having broken legs placed in splints.

EVERSION OF THE UTERUS IN THE COW¹

By J. J. KLINE, Danville, Pa.

The uterus, or womb, is a musculo-membranous sac situated in the sublumbar region and pelvic cavity; it consists of a body and two cornua. The body is cylindrical and somewhat flattened; the anterior extremity, or fundus, is continuous with the cornua; the posterior is continuous with the vagina, constituting the cervix, or neck. In the centre is a transverse aperture or fissure opening into the vagina, called the os uteri.

The cylindrical cornua, which are slightly "twisted" in the cow, spring from the anterior extremity of the body, diverge upwards and forwards, together presenting an inferior free convex curvature and a superior concave one, to which are attached the suspensory ligaments. Their posterior extremity is continuous with the body; while the anterior or summit, forms a cavity turned upwards, into which the fallopian tube enters.

The uterus consists of three coats; serous, muscular, and mucous. The serous covers the body and horns, forms the broad, or suspensory ligaments, which pass from either side of the uterus to the pelvic walls, forming a septum across, dividing the pelvis into the inferior and superior portions. The round ligaments arise from the upper angle of the uterus, proceed to the internal abdominal rings through the inguinal canals, and are lost in front of the symphysis pubis.

The muscular coat consists of two layers, the longitudinal and transverse. The mucous coat is of a pale reddish color, closely adherent to the muscular coat and in the cow presents a number of rounded, vascular processes, which exhibit eminences and depressions; these are termed the maternal cotyledons.

Eversion of the uterus signifies a form of hernia of the organ, consisting in its partial or complete turning inside out; the everted fundus escaping through the os uteri (partial eversion), vagina, and vulva, and perhaps descending as low as the hocks (complete eversion), where it forms a more or less voluminous tumor.

When the eversion is very partial, nothing is seen externally, and an exploration alone reveals the existence of the accident; if more developed, the uterus appears as a round tumor between

¹Presented at the annual meeting of the Pennsylvania State Veterinary Medical Association, Harrisburg, Pa., January 23 and 24, 1923.

the labia of the vulva when the animal is lying, and especially if the floor is sloping backwards, which causes the gastro-intestinal mass to press upon the organ. Sometimes the prolapse is so very slight that there is merely a bulging inward of the fundus, or one of the cornua.

In complete eversion, we frequently have prolapse of a portion of the vagina; and it is recognized as appearing in two forms or degrees, according as there is eversion of the body of the uterus, or eversion of the cornua, which is then deviated to the right or left of the vertical direction of the body of the organ, according as it is one or other of these parts. If both cornua are completely everted, they terminate inferiorly in the form of a cone; but if they are only incompletely so, then they remain cylindrical at their lower end, and at the centre of the cylinder is a depression or cecal cavity.

Eversion of the uterus is possible only when the os uteri is dilated; consequently, it occurs either immediately or soon after calving. It is simple or complicated. It is simple when the viscus is intact, uninjured, and not accompanied by the extrusion or displacement of any other organ. When it is wounded or torn, or when there is accompanying hernia or protrusion of other viscera, then it is complicated.

The symptoms of uterine eversion vary with its extent. Eversion always commences at the fundus of the organ, most frequently towards the largest cornua, where the greater part of the foetus was lodged. Under the influence of an irregular, and kind of spasmodic contraction, this part is drawn, or pushed, inwards; and this action continuing, the fundus or cornua is more or less rapidly carried toward the os, through which it passes into the vagina, dragging after it the body of the organ, which also becomes everted as it proceeds.

The considerable alteration in position and relations which has already taken place, gives rise to sensations of discomfort and pain, and these react on the nervous system, and induce contraction of the uterine and abdominal muscles. Powerful and hurried expulsive efforts ensue, and soon the organ is pushed beyond the vulva, and renders the prolapsus complete, the lining of mucous membrane having become external.

Sometimes we notice portions of chorion still attached to the placental surface of the uterus; and nearly always are seen excoriations, more or less extensive; indications of the injury the organ has sustained, either after or during parturition.

The longer the period which has elapsed since eversion occurred, so the longer is the tumor. This increase is due to the violent expulsive efforts of the animal, as well as to the increase in weight of the organ in consequence of the congestion and infiltration which has taken place in its tissues; constricted—even strangulated—at its upper part, the circulation is maintained with great difficulty, and the capillaries become engorged with blood. The walls of the organ lose their elasticity, become thickened and dense; from its increased volume and position, its reposition is rendered extremely difficult, if not impossible.

At first, there is no perceptible fever, and the animal, in the intervals of straining, attentive to what is going on around it, is solicitous about its progeny, and may even eat. This state is not of long duration, however, for soon after eversion is complete, indications of fever manifest themselves; quickened pulse and respirations, elevated temperature and an expression of anxiety and pain. The straining is more frequent and energetic, and soon exhausts the animal; and the prostration, together with the great weight of the pendent uterus, compels it to assume and maintain the recumbent posture, in spite of attempts to make it get up.

One of the ordinary complications of this accident is the adherence of the foetal placenta to the cotyledons. The complete eversion of the uterus also brings about displacement of the vagina; the deeper portion of this part is found folded on the neighboring surface of the cervix; the bladder and inferior wall of the rectum are drawn into the middle of the pelvic canal, and occupy the place the uterus has quitted; the meatus urinarius is doubled on itself, and so compressed that no urine can flow through it; while the ureters continuing to carry that fluid to the bladder, this reservoir soon becomes filled and greatly distended, without relief being possible. Hence results another source of suffering, and another cause of exhausting efforts which are added to those occasioned by the prolapsed uterus. In certain cases there may also exist prolapsus of the rectum, and displacement, or even eversion, of the bladder.

The uterus may also be wounded or torn, either from bad management during parturition, or from injudicious attempts at reposition; or the injury may be due to rats, cats, dogs, or hogs gnawing at the bleeding mass; or a neighboring animal which inflicts the damage, by stepping on it. After reduction has been effected, metritis and metropéritonitis may appear; this may be

a consequence of gangrene and septic infection.

PROGNOSIS

There can scarcely be any doubt that, if no assistance is rendered to an animal suffering from prolapsus uteri, death must ensue, and more or less speedily; as gangrene is inevitable, while spontaneous reduction is impossible. In some instances death occurs in less than twenty-four hours, while others may live from three to five days, very rarely longer.

Eversion of the uterus is generally fatal when owners of animals have neglected to procure assistance until too late, or who employ ignorant people to attempt reduction. If attended to sufficiently early by those who are competent, the number of recoveries is considerable, and perhaps in no other pathological condition is the utility and power of art, when invoked at the proper time, better demonstrated.

CAUSES

Eversion of the uterus is generally consecutive to parturition, and is most frequent in the cow, whose uterine ligaments are so extensive and extensible. It usually occurs within a day or two after parturition, before the os uteri is closed.

In order that it can occur, a certain degree of relaxation of the sub-lumbar uterine ligaments must be present; there must also be some cause of irritation in operation, after the expulsion of the foetus, sufficient to excite the contraction of the muscles of the uterus and lead to eversion, though it is often difficult to ascertain what this cause may be.

In very many instances gestation has gone on to its full term, the animal is strong and healthy, birth natural and easy, and there is nothing to indicate the advent of such an accident—when, suddenly, after a few expulsive efforts, the uterus is ejected in an everted state.

It has been attempted to explain the occurrence of the accident, by alluding to the lymphatic temperament of the animals, and their consequent laxity of tissues; and it is often the case that cows which are "soft," and kept on food that is better suited for the production of milk than flesh, are the most frequent subjects of eversion.

Difficult and laborious parturition, when much manipulation and energetic traction on the foetus have been employed, has likewise been acknowledged as a cause; and it is certain that the efforts to remove a foetus which—whether from malposition,

deviation of parts, excess of volume, etc.—cannot be expelled in a natural manner, are frequently followed by this accident. But on the other hand, we often find that the most vigorous—even painful and violent traction, and long and complicated manoeuvres—are not succeeded by eversion: while, on the contrary, the easiest and most rapid birth sometimes is.

The retention of the placenta, beyond the ordinary period, must also be taken into account as one of the exciting causes; as it then acts as a foreign body, irritates the interior of the uterus, and so by a reflex action induces contraction of its muscular layer—thus giving rise to invagination of the extremity of one of the cornua, which is supposed to be the commencement of eversion.

It is also probable that injudicious traction on the foetal membranes may bring about this result in a flaccid and dilated uterus, when the cervix is also relaxed. More especially is this likely to happen if the placenta is adherent towards the fundus of the organ, or in one cornua.

Some mystery appears to have attached to this eversion of the uterus, and though various causes have been assigned as operating in its production, yet as these were not present in every case, it has been admitted that a peculiar predisposition must have existed.

Several causes may be invoked to account for the accident. A flaccid, non-contracted uterus after birth, with a weak cervix and dilated os, and relaxed broad ligaments, point to a predisposing condition; and this is most likely to be present in lymphatic animals, or those suffering from atony, brought about by debility through disease, or bad or insufficient food, exposure to weather, etc. Any trifling irritation may lead to a wrong movement of the fundus or one of the cornua, and once commenced it is far more likely to continue than to cease.

TREATMENT

Whatever may be the cause of eversion of the uterus, the obstetrician must lose no time in remedying the accident; as when interference is not prompt, a fatal termination, or at the very least, most serious consequences rapidly ensue.

The preliminary measures consist in combating the local and general symptoms. If the animal is lying down, it must be got up by some means or other, as the standing attitude is by far the best for reducing the eversion, there being more space in the

abdomen when its walls are not compressed by the floor, and the obstetrician can operate more easily and quickly, while the downward inclination of the lower surface of the pelvis and abdomen is favorable for reduction.

If it cannot be made to get up, or is unable to stand when raised, then reposition must be effected while it is lying, by raising the hind quarters of the animal as much as possible, by means of bundles of straw placed under them. Difficulty in reduction may be somewhat diminished, if all the litter be removed from beneath the abdomen, so as to relieve the viscera it contains from pressure as much as possible.

If the accident is recent, an hour or two, or a little longer, the uterus may be returned at once; but should a longer interval have elapsed, it is well to ascertain the condition of the rectum and bladder, and to empty them if necessary.

Should the foetal membranes still be adherent—wholly or partially—then they must be carefully removed without injuring the cotyledons; and if any pulpy gangrenous cotyledons are found, it is better to remove them at once than leave them to be eliminated in the ordinary way; though if they show any vitality at all they need not be interfered with. Torn or gangrenous portions of mucous membrane are also to be excised.

The uterus should be cleansed from matters adhering to its surface, such as litter, mud, dirt, filth or blood; by means of a fine sponge or soft cloth and water. Milk and water makes a desirable wash. Astringent or soothing lotions are recommended, if there is much tumefaction or irritation present. Some practitioners immerse the entire uterus in cold water, allowing it to remain in it for as long as five or ten minutes. By this means it is freed from extraneous matter and cleansed; while the congestion is allayed and the mass considerably reduced in size.

If from long eversion and consequent congestion, infiltration, or inflammation, the volume of the uterus is so increased that it appears impossible to return it, superficial scarifications may be made on its surface; a few of these often lead to a notable decrease in its size, and reduction may then be effected.

If the uterus is torn, it may be necessary to close the wound by the continuous suture. If the wound, however, is not extensive, it need not be closed. There are many cases on record in which wounds of the uterus have not been sutured; the organ having been merely returned to the abdominal cavity, and recovery has taken place. If hernia of the intestines or any other

viscus is present, then, of course, this must be reduced before the uterus.

When eversion of the uterus is incomplete, and the organ has not passed beyond the vagina, reduction is comparatively easy. It is sufficient to introduce the closed fist into the vagina, and to push the uterus as far into the abdomen as may be deemed necessary, smooth it out by removing all folds and kinks, and let your hand remain in the uterus for a short time, until straining ceases, then place the animal in a narrow stall and elevate the hind quarters.

If the uterine tumor is voluminous, and hangs as a heavy mass, as low as the hocks, the best method is to return, first, the parts of the organ nearest the vulva. In order to accomplish this, two assistants, one on each side of the croup, raise the uterus with a well moistened and clean sheet, so as to bring it near the vulva, and opposite the axis of the pelvis. Then the operator gently presses with open hands on each side on the parts close to the vulvar opening, in order to force them gradually into it. By acting in this way with care and patience, and preventing, as well as he can, the expulsion of these portions he has already reduced, the tumor by degrees becomes diminished, and may be entirely returned. In some instances it will be found that, towards the termination of reduction, the organ itself returns to its normal position.

When the uterus has been returned to the abdominal cavity, the operator has then to ascertain if it is properly disposed. It sometimes happens that the extremity of one or other of the cornua remains incomplete; this will undoubtedly induce renewed straining, and in all probability bring about re-eversion. It is, therefore, essential that the hand of the operator should carefully examine every part of the interior of the uterus and the genital canal, and particularly around the cervix.

When reposition has been finally accomplished, the straining ceases, and the animal soon appears to be quite easy; it is advisable to keep the hand in the uterus for a short time until the latter begins to contract freely; if this is not done, the flaccid organ may again become everted.

RETENTION

Reduction of the everted uterus having been accomplished, and everything done to remove the slightest traces of invagination, certain precautions must be adopted against a possible

recurrence of the accident. This recurrence is to a certain extent provided for by raising the croup of the animal as high as may be convenient, either by means of litter or boards. But this is not always a preventive, and other means have been devised for retaining the uterus in its place until all risk of another eversion has passed away. These devices consist of pessaries, sutures, and bandages or trusses.

Pessaries are instruments of various forms, which are introduced into the genital organs, and kept there for a certain time, in order to prevent displacement of the uterus after its reduction. Sutures may be of hemp, silk, or metal; and they may be passed directly through the lips of the vulva, or include the skin towards the point of the hip, on each side. The first, the labial suture, the second, the hip suture. Bandages, or trusses, may be composed of cords, surcingle, leather, canvas, etc., which are so arranged and disposed as to make pressure upon the sides of the vulva, and by keeping it closed, prevent the extrusion of the uterus, without interfering with defecation or micturition.

There are several kinds of trusses in use, and these vary somewhat in their details, though in principle they are the same. The most useful and readily made truss is composed of light rope about the thickness of a man's little finger, or an ordinary rope clothes-line, about thirty feet long, divided in the middle, making two ropes. These two ropes are doubled upon themselves, forming two loops, which by inter-weaving a few times will form a stationary loop in their middle, in such manner that an oval space, sufficient to admit the vulva, and compress it laterally, is formed; the inferior commissure being left free, to allow the escape of urine and uterine discharges, should there be any. The two portions of one of the ropes, passing over the back, are secured around the neck or chest; while those of the other rope pass between the thighs, and are brought up immediately in front of the stifle, up and anterior of the angle of the ilium, and secured to the back rope, from both sides.

AMPUTATION

In certain cases the uterus is so injured, either by the unskillful attempts of ignorant men to return it, or from other causes, that it would be certain death to the animal to replace it in the abdomen. These other causes consist of extensive lacerations and bruises, or when the organ has become softened and gangrenous. Lacerations and ruptures are always more serious in

the lower than the upper wall of the uterus. In such exceptional circumstances complete extirpation of the uterus has been practiced.

Though the operation is apparently a most formidable and painful one, and only to be ventured upon as a last resource, yet, on the whole, it is tolerably successful. Various modes of operating have been practiced and recommended. Chloroform, chloral, or morphia may be administered to the animal about to be operated upon. It is also a good plan to tie the uterus up in a large cloth, so that it may be more easily moved about by the operator or assistants, and render the operation cleaner and less repulsive looking.

Perhaps the most popular method is the ligature in mass. A piece of strong whipcord, well waxed and made into a running loop, is passed over the tumor as near the vulva as possible, but without including the meatus urinarius. When evenly placed around the pedicle, it is then gradually, but firmly, tightened by pulling at each end so as completely to intercept the circulation in the mass. This done, the cord is tied in a knot.

Though this method has been much employed, and with a fair amount of success, yet it has been condemned by some good authorities, on the plea that it is dangerous to tie such a voluminous mass; as all the parts can not be sufficiently and equally compressed to become mortified at the same time. Those parts which have not been firmly bound still retain a certain amount of circulation, become inflamed, and occasion violent pain.

Therefore a double ligature has been recommended. A long sacking needle is armed with a somewhat long double piece of whipcord. This is passed through the middle of the pedicle of the tumor, from below to above; and the needle cut away from the cord. The pedicle is thus perforated by two pieces of cord; one of these is firmly tied round the right half of the pedicle, the other round the left, so as to include the whole in two separate ligatures.

The uterus of the cow has been successfully deprived of its circulation by means of clamps applied close to the vulva. By whatever procedure the pedicle is rigidly compressed, the uterus has afterwards to be excised. When the uterus has been cut away, the portion of vagina or cervix remaining should be returned as far as possible into the genital canal, and if there is any hemorrhage, injections of cold water will probably check it. Cicatrization generally occurs within about fourteen days.

SOME CRITICAL TESTS OF ARECOLINE HYDRO-BROMIDE AS AN ANTHELMINTIC

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The areca nut used in medicine is derived from the fruit of an East India palm, *Areca catechu*. Areca nut, mixed with the leaves of the betel pepper and with lime, is chewed by natives of parts of the Orient, the mixture being known as betel nut. Betel nut imparts a red color to the saliva and excreta.

Areca nut, powdered, has long been in use in human and veterinary medicine as an anthelmintic, and appears to have been used as a folk remedy for worms in India before obtaining a place in medical practice. According to the Dispensatory, it was reported as a taeniicide in human medicine by Edw. Morris, at least as early as 1862, and as a taeniicide for dogs in veterinary medicine by Hanley (cited by Dun) the same year. In human medicine, the usual dose is 1 to 2 drams (3.9 to 7.7 gm.). In veterinary medicine, the doses given by Winslow are: Horses, 0.5 to 1 ounce (15 to 30 gm.); lambs, 1 dram (4 gm.); dogs, 2 grains for each pound of live weight (2.85 gm. for a 10-kilo dog); fowls, 10 to 40 gr. (0.648 to 2.59 gm.). The nut should be freshly ground for use as an anthelmintic, as it loses its potency with age and ultimately becomes inert or practically inert. In large doses the drug is a cathartic, but in small doses it is astringent. Substantially the same is true of a number of other drugs, and failures to use adequate doses of purgatives in connection with anthelmintics may give rise to bad effects, following a constipation resulting from the use of doses too small to induce purgation.

Areca nut contains arecoline, arecaine, arecaine, guvaine, red tannic acid, and an oil. The arecoline is undoubtedly anthelmintic and, according to Jahns, the arecaine is also a taeniicide. A very effective combination of male fern and areca nut which has been extensively used with excellent results by Dr. E. T. Davison, of the Bureau of Animal Industry, is used as follows: Fast dog overnight. At 10:00 a. m., for dogs of average size, give 4 10-grain capsules (those holding 10 grains of quinine) filled with oleoresin of male fern, and follow with an ounce of water or milk, preferably milk. Forty-five minutes later, give

4 10-grain capsules full of freshly ground areca nut, and follow this with an ounce of milk or water as above. Worms usually pass in a half-hour to an hour.

The fact that areca nut should be freshly ground for use each time constitutes more or less of an objection to its use and limits its usefulness in some respects. Areca nuts are quite hard and it is something of a task to grind or "cobble" areca nuts by means of machines operated by hand. Furthermore, the fact that the drug loses its potency after grinding makes it somewhat unsuitable for use in preparations to be marketed and perhaps held for considerable periods of time before use.

Recently one of the salts of arecoline, arecoline hydrobromide, has come into rather common use as an anthelmintic in canine practice. This drug has been used for some years in veterinary medicine as a purgative, being given subcutaneously. It is mentioned in this connection by Winslow, in 1908. It seems to have been used as an anthelmintic in human medicine before it was used in veterinary medicine, and the Nineteenth Edition of the Dispensatory, issued about 15 years ago, states: "In human medicine it has been used in the dose of one-fifteenth to one-tenth grain (0.004-0.006 gm.) against the tapeworm and as a myotic." The use of this drug in human medicine evidently received little attention and is little known among medical men. We are informed by Dr. David E. Buckingham that a physician in Washington has used this drug successfully in his practice on at least one occasion.

In veterinary medicine, the use of arecoline hydrobromide as an anthelmintic appears to have been first recommended, so far as we have ascertained, by Lentz, in 1921, in an article published in the University of Pennsylvania Bulletin, Veterinary Extension Quarterly, Number 3, this article being republished in the JOURNAL OF THE AMERICAN VETERINARY MEDICAL ASSOCIATION for December, 1921. Lentz makes the following statements in connection with the subject of tapeworm infestation: "Many drugs have been recommended in the treatment of animals infested with these parasites, but none act so quickly and seem to possess such a specific action against them in the dog as arecoline hydrobromide. This drug is given by the mouth in tablet form on an empty stomach. One-fourth of a grain may be given to medium-sized dogs and one-eighth of a grain to the small breeds. It acts on the bowels in from 20 minutes to one-half hour and the parasites are passed with feces. A single treatment

seems to remove all the parasites including the heads. . . . It is of advantage to follow the arecoline treatment, after the worms have been passed, with 10 to 15 drops of camphorated tincture of opium (paregoric) in a dram of essence of pepsin to quiet down the excessive peristaltic action caused by the arecoline."

Since experience shows that the actual efficacy of an anthelmintic can not be determined with any degree of accuracy on clinical findings alone, and since arecoline hydrobromide is being extensively used, we have carried on some critical tests, collecting all worms passed or present post mortem, to obtain some definite information as to the action of this drug, using dogs and chickens infested with tapeworms as test animals. The drug used was analyzed in the Biochemic Division of this bureau and found to be arecoline hydrobromide in the amount stated for the tablets used. The tests on dogs were as follows:

THERAPEUTIC DOSES BY MOUTH

Dog 426; wt. 40 pounds (18 kilos); $\frac{1}{8}$ grain in tablet; feces containing 2 complete, live tapeworms in 9 minutes; vomited twice; no other worms passed in 2 days; post mortem, 1 hookworm; 100 per cent effective against tapeworms, 0 per cent against hookworms.

Dog 432; wt. 30 pounds (14 kilos); $\frac{1}{4}$ grain in tablet; feces containing 1 complete, live tapeworm in 30 minutes; vomited once; much depressed; 4 ascarids passed the first day; post mortem, 2 days after treatment, 32 whipworms, 1 hookworm; 100 per cent effective against tapeworms and ascarids, 0 per cent against whipworms and hookworms.

Dog 435; wt. 25 pounds (11 kilos); $\frac{1}{4}$ grain in tablet; no feces the first hour; no worms passed in 2 days; post mortem, 1 tapeworm, 79 hookworms; 0 per cent effective against tapeworms and hookworms.

Dog 487; wt. 25 pounds (11 kilos); $\frac{1}{4}$ grain in tablet; no feces the first hour; no worms passed in 2 days; post mortem, 1 tapeworm, 4 ascarids; 0 per cent effective against tapeworms and ascarids.

Dog 490; wt. 20 pounds (9 kilos); $\frac{1}{4}$ grain in tablet; passed formed feces and vomited in 30 minutes; passed soft feces with 1 complete, live tapeworm in 50 minutes; no other worms passed in 2 days; post mortem, 5 hookworms, and 4 whipworms; 100 per cent effective against tapeworms, 0 per cent against

hookworms and whipworms.

Dog 556; wt. 22 pounds (10 kilos); $\frac{1}{4}$ grain in capsule; passed tapeworm fragments the first day; no worms the next 3 days; post mortem, no worms; 100 per cent effective against tapeworms.

Dog 558; wt. 20 pounds (9 kilos); $\frac{1}{4}$ grain in tablet; passed tapeworm fragments second day, with no heads; no other worms in 4 days; post mortem, 2 tapeworms, 12 whipworms; 0 per cent effective against tapeworms and whipworms.

In 7 experiments, using therapeutic doses, arecoline hydrobromide removed all the tapeworms in 4 cases and none in 3 cases; all the ascarids in 1 case and none in 1 case; no hookworms in the 4 cases where this worm was present; and no whipworms in the 3 cases where this worm was present. Whenever tapeworms were promptly examined after passage they were found alive; this was true of *Taenia* and of *Dipylidium*.

Dr. Quitman writes us that Frohner injected arecoline hydrobromide into the ligated intestinal loop containing numerous worms, without visible effect on the worms. In our opinion, there is an anthelmintic effect, quite apart from a purgative effect, even though it was not detected in Frohner's experiments.

Reports received in correspondence indicate that arecoline hydrobromide will sometimes fail to remove tapeworms in practice, as well as in critical experiments. One correspondent reports his results as follows:

Dog 1; 50 pounds; $\frac{1}{4}$ grain; passed several tapeworms, most of them with heads; repeated treatment 10 days later; passed 2 tapeworms, 1 with head, the other uncertain as to this.

Dog 2; 15 pounds; $\frac{1}{8}$ grain; passed about 100 small, complete tapeworms; 7 days later gave 0.5 cc oil of chenopodium in a half-ounce of castor oil; dog vomited 3 complete tapeworms; 3 days later gave $\frac{1}{8}$ grain arecoline hydrobromide; no tapeworms passed.

Dog 3; 15 pounds; $\frac{1}{8}$ grain; no bowel movement in 3 hours; treatment repeated at this interval; treatment repeated for the third time after an interval; small amount of feces, but no worms; 10 days later repeated treatment; no bowel movement in 3 hours; treatment repeated at this interval; dog passed a large number of tapeworms in 40 minutes.

In the above reports, initial treatments failed to get all of the tapeworms in all 3 cases. A second treatment brought away tapeworms in 1 case; a different treatment resulted in tapeworms being vomited in 1 case; a second, third and fourth treatment

removed no tapeworms in the third case, but a fifth treatment removed a large number.

EXCESSIVE DOSES BY MOUTH

Dog 565; wt. 22.5 pounds (10 kilos); 1.5 grains in tablet; vomited in 4.5 minutes; passed feces in 27 minutes; passed 15 tapeworms, 1 ascarid and 1 hookworm the first day; no other worms passed in 4 days; post mortem, 2 ascarids, 81 whipworms; 100 per cent effective against tapeworms and hookworms, 33 per cent against ascarids, 0 per cent against whipworms.

Dog 567; wt. 24 pounds (11 kilos); 2 grains in tablet; feces in 7 minutes; vomited within 24 minutes; passed 3 tapeworms the first day; no other worms passed in 4 days; post mortem, 5 tapeworms, 8 hookworms, 64 whipworms; 37.5 per cent effective against tapeworms, 0 per cent against hookworms and whipworms.

In these 2 experiments, using excessive doses (1.5 to 2 grains), arecoline hydrobromide removed all the tapeworms in 1 case and 37.5 per cent in 1 case; all the hookworms (1) in 1 case and none in 1 case; no whipworms in either case.

In the following experiments the dogs did not have tapeworms and were not killed, the test being primarily to determine the tolerance of dogs for excessive doses.

Dog 566; wt. 15 pounds (7 kilos); $\frac{1}{2}$ grain in tablet; vomited and passed feces in 3 minutes; no worms the next 4 days.

Dog 568; wt. 21 pounds (9.5 kilos); 1 grain in tablet; vomited in 6 minutes; passed feces in 8 minutes; dog sick and trembling; passed 1 whipworm the second day and 4 whipworms the fourth day.

Dog 469; wt. 22 pounds (10 kilos); 1.5 grains in tablet; dog lying down, collapsed in 1 minute (this dog was evidently suffering from some condition apart from the effects of the drug and did not behave like a normal dog); vomited in less than 20 minutes and again in 20 minutes; passed 1 whipworm the first day and 1 the second day.

Dog 564; wt. 28.5 pounds (13 kilos); 2 grains in tablet; vomited and passed feces in 4 minutes; lay down in 9 minutes; no worms in 4 days.

In the above experiments a small dog (7 kilos) tolerated $\frac{1}{2}$ grain of arecoline hydrobromide, dogs of average size (9.5 and 10 kilos) tolerated 1 to 1.5 grains, and a dog of slightly more than average size (13 kilos) tolerated 2 grains. The three larger animals showed whipworm eggs on fecal examination and in

these large doses the drug removed some whipworms from 2 dogs, but in the largest dose (2 grains) failed to remove any from a lightly infested dog. The safety may be correlated in part with the occurrence of emesis, tending to cause the automatic rejection of excessive amounts of the drug.

The correspondent previously referred to reports that he has given a pup, 6 weeks old, weighing 5 pounds, a dose of $\frac{1}{8}$ grain without bad results.

EXCESSIVE DOSES HYPODERMICALLY

In view of the fact that some persons have suggested to us that arecoline hydrobromide might remove tapeworms purely as a result of its purgative action, the following experiments were carried out, the drug being given hypodermically. According to Lynch, the dose of arecoline hydrobromide, to secure purgation in the dog, is 1/30 to 1/15 grain. The doses we employed were larger.

Dog 549; wt. 13.5 pounds (6 kilos); $\frac{1}{8}$ grain in solution; considerable depression 10 minutes after dosing; few terminal segments of tapeworm passed the next 2 days; post mortem, 11 tapeworms (6 *Taenia pisiformis* and 5 *Dipylidium caninum*), 8 hookworms, 11 whipworms. No tapeworms, hookworms or whipworms removed by treatment.

Dog 552; wt. 18.5 pounds (9 kilos); $\frac{1}{4}$ grain in solution; pronounced weakness and depression 10 minutes after dosing, persisting for about 30 minutes; no worms passed in 2 days; post-mortem, 8 tapeworms (*D. caninum*), 2 ascarids, 10 whipworms. No tapeworms, ascarids or whipworms removed by treatment.

Two other dogs, Nos. 546 (10 kilos) and 542 (8.5 kilos), were also given $\frac{1}{4}$ grain in solution hypodermically, but were not examined postmortem. The drug produced extreme depression, lasting about 30 minutes.

The above results are in accord with what we would expect. It is true that purgatives will occasionally remove some worms, but this is not a dependable anthelmintic action and is apparently due to certain factors, such as old age or disease conditions on the part of the worms removed, which can not be depended on to be present in the majority of cases. Hall and Foster (1918) report that calomel, 4 to 5 grains (erroneously stated as grams), followed by castor oil, removed 1 ascarid from 4 infested dogs, 2 of these dogs showing 8 and 10 ascarids each post mortem, the others not being killed; castor oil administered to 50 dogs removed

27 ascarids out of 351 present, or a little over 7 per cent, removed 1 hookworm out of 1,062, and 2 whipworms out of 464.

Some anthelmintics, as chenopodium, are constipating, while others, as areca nut, are purgative, a fact which is partly responsible for the somewhat academic distinction between vermicides and vermifuges, but if drugs remove worms with any degree of certainty we must assume that they exert some action on the worms, in addition to their purgative action on the intestine where such action is present. This action may or may not be destructive to the worms, it may be depressant or stimulative, and the fact that the worms are alive when passed, especially when passed very soon after the administration of the drug, does not preclude the existence of an adverse action on the worms. We have already referred to Fröhner's experiments in this connection. The production of temporary or permanent incoordination, due to the action of a drug on the nervous or muscular system of the worm and resulting in inability on the part of the worm to maintain its position in the host animal, must be regarded as an anthelmintic action of a definite sort on the part of the drug. Santonin appears to have such an action.

So far as arecoline hydrobromide is concerned, it would be expected that if the drug had an anthelmintic action when administered hypodermically the fact would have been noted in veterinary practice. Our experiments with its hypodermic administration are too few of themselves, especially in view of some failures with the drug when given by mouth, to permit us to draw definite conclusions except in connection with clinical experience, but this clinical experience seems to sustain the idea that the drug is not anthelmintic when given hypodermically.

EXPERIMENTS WITH BIRDS

The drugs commonly used to remove tapeworms from mammals are not very effective as a rule in removing tapeworms from chickens. The following experiments were carried on to ascertain if this was true of arecoline hydrobromide administered by mouth.

Chicken 20; $\frac{1}{4}$ grain, some tapeworm fragments passed first day; no other worms passed in 4 days; post mortem, 21 tapeworms (*Hymenolepis* sp.), 22 *Ascaridia perspicillum*, 50 *Heterakis vesicularis*, 2 *Gongylonema ingluvicola*. Treatment apparently entirely ineffective against tapeworms and the nematodes present.

Chicken 21; $\frac{1}{4}$ grain, 1 *H. vesicularis* passed the first day; no

other worms passed in 4 days; post mortem, 7 tapeworms (*Hymenolepis* sp.), 7 *A. perspicillum*. Treatment entirely ineffective against tapeworms and most of the nematodes present; removed all the heterakids (1) from the ceca.

Chicken 22; $1/16$ grain; 1 *H. vesicularis* and some tapeworm fragments passed the first day; no other worms passed in 4 days; post mortem, 34 tapeworms, 1 *A. perspicillum*, 46 *H. vesicularis*, 8 *Tetrameres* sp. Treatment ineffective.

Chicken 23; $1/16$ grain; no worms passed in 4 days; post mortem, 12 tapeworms, 34 *H. vesicularis*, 4 *Tetrameres* sp., 1 *Cheilosporium hamulosa*. Treatment entirely ineffective.

Chicken 24; $1/32$ grain; 2 *H. vesicularis* the first day; no other worms in 4 days; post mortem, 10 *H. vesicularis*. No conclusions in regard to tapeworms; 17 per cent effective against the cecum worm.

Chicken 25; $1/32$ grain; no worms passed in 4 days; post mortem, 303 tapeworms, 16 *H. vesicularis*, 3 *Tetrameres* sp. Treatment entirely ineffective.

In the above experiments the administration of arecoline hydrobromide in doses of $1/32$ to $1/4$ grain to 6 chickens, 5 of which had tapeworms, removed some tapeworm fragments from 2 birds, but left a total of 377 worms. The treatment, therefore, promises nothing in this connection. It removed 4 *H. vesicularis* and left 156. Other nematodes were not affected.

SUMMARY

Efficacy: Arecoline hydrobromide in therapeutic doses has an efficacy as an anthelmintic and as a purgative which is approximately comparable, apparently, to the efficacy of freshly ground areca nut in therapeutic doses. In general, the best anthelmintics for removing tapeworms do not show the same certainty of action that the best anthelmintics for removing nematodes do. The failure is commonly associated with a failure to remove the head. The exact reason why the head is so often left behind is not known, but in the case of *Dipylidium* it is probably associated with the burrowing habit of the worm and its tendency to sew itself into the intestinal mucosa.

Arecoline hydrobromide, in therapeutic doses, like the best anthelmintics for removing tapeworms, will sometimes remove all the tapeworms from dogs and will do this, probably, in the majority of cases (4 out of 7 cases in our experiments). In therapeutic doses it will sometimes fail to remove any tapeworms

from dogs, but this will happen, probably, in a minority of cases (3 out of 7 cases in our experiments). In excessive doses (1.5 to 2 grains) it may remove all the tapeworms present or as little as 37.5 per cent; conceivably it might fail to remove any under certain conditions. That arecoline hydrobromide may sometimes fail in practice as well as in experiments is indicated by some reports which have come to our attention and which are noted here. In view of the erratic action of anthelmintics for removing tapeworms, it would require a large number of critical tests to enable us to compare with any degree of accuracy the efficacy of arecoline hydrobromide with that of male fern, kamala and other drugs in this group.

Arecoline hydrobromide, like anthelmintics in general for removing tapeworms, shows much less efficacy in removing tapeworms from chickens than in removing tapeworms from mammals such as dogs. This may be due in part to the speed with which substances in general, and especially purgatives, pass through the digestive tract of chickens. Evidence as to the rapidity with which ingested material passes through the digestive tract of chickens has been published by Browne (1922) and more recently by Kaupp and Ivey (1923).

Safety. Arecoline hydrobromide appears to be a fairly safe drug for use in therapeutic doses for removing tapeworms. The doses of 1.5 to 2 grains given to dogs weighing 10 to 13 kilos have indicated safety factors of 6 and 8 for the therapeutic dose of $\frac{1}{4}$ grain for dogs of this size. We have not yet learned of the death of a dog from arecoline hydrobromide, and while this might occur, it would probably occur only exceptionally and in dogs highly susceptible, for some reason or other, to the effects of the drug.

The depressant effects of the drug are often quite marked, and the veterinarian's clients are sometimes unfavorably affected by the evidence of more or less depression, distress, vomition, etc. Some veterinarians are inclined to regard this as sufficient reason for discarding the use of arecoline hydrobromide. In our opinion, the factors of efficacy and safety are of more importance in the selection of drugs. It must be admitted that the effect on the client with its entailed effect on the business side of veterinary practice can not be overlooked, but should the veterinarian treat the patient primarily and the client secondarily, or the client primarily and the patient secondarily?

CONCLUSIONS

Like other good drugs for removing tapeworms, arecoline

hydrobromide will often remove all the tapeworms present. In our experiments this happened in a majority of cases where a therapeutic dose was given (4 out of 7 cases). It will occasionally fail to remove any tapeworms. In our experiments this happened in a minority of cases where a therapeutic dose was given (3 out of 7 cases). In some cases it will remove some tapeworms and leave others. In our experiments this happened once where an excessive dose (2 grains) was given. It will occasionally remove some roundworms, but has comparatively little value for this purpose.

Arecoline hydrobromide appears to be quite safe. It causes depression, emesis and catharsis, but animals recover rather promptly from its effects. The safety factor appears to be at least 8 and may be much higher. The safety may be due in part to the production of emesis.

In addition to its efficacy and safety, this drug has an advantage over most drugs for removing tapeworms in that its bulk is very small and it acts as a purgative, making it unnecessary to give purgatives in addition. It acts promptly and this prompt action makes a favorable impression on a veterinarian's clients.

We Want 5000 Members This Year.

LARGEST LITTERS FROM YORKSHIRE SOWS

Records show that sows of the Yorkshire breed produce larger litters, as a rule, than sows of other breeds. Figures from a large number of litters show that the average Yorkshire litter was composed of 10.2 pigs; Chester White, 9.3; Tamworth, 9.4; Duroc, 8.4; Berkshire, 8.3; Hampshire, 8.2; Poland-China, 8.0.

These figures are averages, of course. Mr. Schwartz, who produced 3,040 pounds of pork from one sow in six months, in the Indiana Ton Litter Club last fall, did this remarkable stunt with a litter of eleven Poland-Chinas, the breed which, according to the foregoing figures, has the lowest average. No other litter in the Ton Litter Club came anywhere near this weight. There were thirty-six that weighed over a ton.—*The Farm Journal*

Have You Secured One New Member This Year?

BIOLOGICAL THERAPEUTICS IN BOVINE HEMORRHAGIC SEPTICEMIA AND EQUINE INFLUENZA¹

By W. P. BOSSENBERGER, Williams, Iowa.

In presenting this paper I have nothing new to offer regarding the causes of contagious, infectious disease, but in carrying out a large number of autopsies I have noticed many changes in the blood and other body fluids, and my findings in those changes have been considered worthy of mention for the benefit of others. I do not doubt that some of them have been noticed by other practitioners and my remarks may be uninteresting material to many, yet let us exchange our views upon this infection and hope that we may arrive at a better and more successful treatment.

Hemorrhagic septicemia, in its uncomplicated form, does not seem to be very difficult to treat, since we have the numerous and valuable biologicals at our command. Still, year after year, we come in contact with mixed forms, which offer the most stubborn resistance to any form of treatment. These mixed forms may vary from very light affections, which generally pass unnoticed by the owner, to those which are more serious and cause endless amount of anxiety to the practitioner.

This variation in virulence depends upon many factors possessed by the bacterium or by the animal. Among these we might mention the amount of immunity the animal has towards the infection, the virulence or pathogenicity the bacteria possess or are able to produce, and the sort of infection present. Bacteriologists have demonstrated by laboratory experiments that certain bacteria act as symbiotes with others, in some forms of mixed infections, thereby allowing or assisting one group or another to produce a much more powerful toxin than when existing in a single type of infection.

The more complex the infective agents are the more severe will be the course of the disease. Each group of bacteria produces certain forms of toxins, and these in turn have certain pathogenic effects upon the system. Should they exist in many forms, we can readily see why a combination of them has such rapid and fatal effects.

¹Read before the North Central Iowa Veterinary Association, Fort Dodge, Iowa, May 28, 1923.

Before taking up the consideration of the effects of bacterial toxins let us consider the part nature plays in attempting to wall off the invaders. When gaining entrance to the body she calls upon the defensive forces, the phagocytes, to expel them or render the invading army powerless. This action can be studied by noticing the various catarrhal conditions and examining them microscopically. Here we find numbers of cells containing bacteria of various shapes and forms. When bacteria come in contact with mucous membranes they produce irritation, either by their motility or the toxins excreted, and nature at once sends out the defensive forces to allay that action. If nature is successful in these efforts, the animal soon recovers, but if the army is too powerful and breaks through the lines of defense, illness results, the degree of which depends upon the number of the invaders and the virulence of the toxins they are able to produce.

It seems as though the more virulent the infection is, the less action will the defensive forces have upon them. This can be ascertained by the condition of the bacteria contained within the cell, in that the lower the grade of infection the more distorted will be the microbe which it has ingested. Catarrhal conditions of the mucous membranes are brought about by any irritant and produce symptoms which frequently pass unnoticed by the owner. The animal may show only an inclination of slight depression, a craving appetite, a symptom which the owner usually considers a sign of good health, until the animal fails to maintain its body flesh, when he is informed of some faulty condition.

Microscopical examinations of the catarrhal exudate in those instances will fail to demonstrate any bacteria, or at the very most, a very scant number of them. Again, in irritations due to a non-toxic invader, there will be noticed an abundance of the large mononuclear leucocytes present, but when infectious irritants are present we notice more of the small polynuclears present. In highly infectious irritations we sometimes do not notice the catarrhal manifestations and only a slight mucous discharge, which I believe is nature's attempt to flood away the irritating material. Should she fail to do so, symptoms of illness rapidly follow, which is testimony of the invaders having overcome the resisting powers of the animal and that they have produced their effects upon the animal's cells, whether of the blood, lymph or nerves. When the bacteria produce an external,

or exogenous toxin, they are more capable of repulsing nature's efforts and can also gain entrance more rapidly. After having gained entrance into the body, they are not yet free to travel at liberty, as they then come in contact with still other antagonistic forces, such as the lysins, precipitins, agglutinins and various other bodies.

Some of those actions cannot be studied without laboratory facilities, but the agglutination can be noticed when making microscopical examinations, by the manner in which the bacteria are grouped together, that is, there are scarcely any or only very few free bacteria. This can also be seen by taking a sample of infective material and examining it and noticing how the germs exist in single numbers through the smear. Then take another sample, where treatment has been of short duration, and notice how the bacteria exist in clumps with very few free ones. After noting all of those changes they have caused me to alter treatments from those usually employed and which, I believe, are responsible for the more satisfactory results obtained from the use of the various anti-sera and other biologicals.

Not so very long ago I had demonstrated to me results which I can lay to my improper treatment. A number of cattle evidenced symptoms of hemorrhagic septicemia and I immediately gave an immunizing dose of hemorrhagic septicemia bacterin. The following morning six or seven of the animals were down, unable to rise. Several died the following day. Next day more were down and more had died, while still others were coming down with the disease. I saw in that herd the reaction of the bacterins, creating an aggravated form of the infection, which might have run a less severe and less fatal form, and I resorted to the more scientific treatment, that of preparing the system to accommodate a dose of bacterins, small as they were. I have long practiced the routine of *not giving bacterins to an animal showing symptoms of illness*, yet in a few cases I have violated this conclusion, to my sorrow.

In administering a dose of bacterins to an animal there is a call upon the defensive forces, and when the body is already laden with infective agents it generally has as much to contend with as it can, to hold the infection in check. Then along comes the veterinarian, who administers still more invaders and the defensive forces of the body are overpowered and the battle rages in its wildest form, causing death to the host. In carefully graduated doses the anti-sera produce more satisfactory results

and have been my routine treatment except in a few cases. Where I have transgressed from that line of treatment the results never have been as satisfactory, for some reason or another, and where loss did occur it can be attributed to that cause.

In the past year we have had on the market a drug of the aniline dye group, that will find many useful places in veterinary practice, as it is a powerful germicide, without any irritating effects. It can be administered intravenously as safely as it can be applied locally, with equally good results. In certain infections it is superior to the biologicals as the initial treatment, as it renders the bacteria less active through its germicidal activities, thereby allowing the phagocytes to act more readily upon invaders or their products.

As the toxins and medicinal substances introduced into the blood-stream are carried by the protein of the cells, I believe we should employ remedies that are so carried, in preparing the system for biological therapy. Sodium cacodylate is also a very valuable product to employ in such conditions and I frequently administer it with the anti-sera, with apparently very satisfactory results. Arsenic being a poison and carried by the cell protein, it at once inhibits or kills the toxin, without producing ill effects upon the patient. Large doses have been given at one time and repeated daily in serious cases with very satisfactory results. When this method has been omitted, very unsatisfactory results have followed, in the majority of cases.

As another illustration of the harmful effects bacterins will produce, when injected into an animal showing symptoms of the infection, let me cite a case where a number of horses had been shipped by rail from Keokuk to Blairsburg, in the spring of 1920. The owner, Mr. J. L. Neff, reported his horses ill several days after arrival and on arriving at the farm I found two down, unable to rise. Each of these received a dose of anti-influenza serum intravenously, one dying the next day and the other improving.

The balance of the animals each received a dose of bacterin and the next evening each and every animal that received bacterin became very stiff in all four feet. Typical symptoms of laminitis had developed in all of them except the animal receiving the serum treatment, which continued to improve rapidly. The owner, seeing that the animals which did not seem so ill, suddenly becoming very much so, placed the cause on the

treatment, as he was certainly entitled to do, even though I did not admit that fact before him. Heroic treatment was required to save those animals and each received anti-influenza serum intravenously for two or three daily doses, before there were signs of improvement. All recovered in good order, but I am satisfied that if I had not administered the anti-serum intravenously that they could not have resisted the action produced by improper treatment long enough to allow absorption from a subcutaneous injection.

This case in particular demonstrated to me the folly of administering bacterins to an animal that already harbors the germ, if you expect to obtain the most satisfactory results. I do not know that sodium cacodylate was much used at that time, and what I did have was in the form of a salt, which of course I dissolved in water, but never used it for intravenous administration. Perhaps if I had given it with the serum the results would have been even more satisfactory.

Have You Secured One New Member This Year?

VETERINARY STUDENTS AS EDITORS

A copy of the Veterinary Edition of the Rocky Mountain Collegian has come to hand. This was prepared and edited by the students of the Division of Veterinary Medicine of the Colorado Agricultural College, at Fort Collins, and they certainly did themselves proud. It is to be hoped that this edition of the Rocky Mountain Collegian was given wide circulation throughout the West, as the articles contained therein, on subjects relating to the veterinarian and his activities, give the finest kind of publicity for our profession.

Does Your Wife Know About The Women's Auxiliary?

R. O. T. C. HORSE SHOW AT M. A. C.

At the R. O. T. C. Horse Show, held at the Michigan Agricultural College, on Memorial Day, Miss Dorothy Giltner, daughter of Dr. Ward Giltner (Corn. '06) placed second in the ladies' saddle class. Dr. J. P. Hutton (O. S. U. '10) placed third in the gentlemen's saddle class. Several thousands of people from Central Michigan witnessed the Show, which is evidence that interest in good horse flesh is much on the increase. Prizes totalling \$500 in value were awarded the winners.

THE TAPEWORMS OF A CAT¹

By HOWARD CRAWLEY, *Philadelphia, Pa.*

The animal on which the following observations were made was taken in as a stray, in May, 1921, and since that time has been kept as a house cat, being allowed out of doors only at long intervals and then for a few minutes at a time. It has therefore never been in contact with other animals, either cats or dogs, and in consequence it seems fair to assume that all the parasites it has ever harbored are the descendants of those present at the date mentioned. At that time it was about four months old.

The kitten was readily taught to make use of a pan for its natural dejecta, and this procedure permitted observations to be made on the feces. In June, 1921, these were observed to contain tape-worm segments, and treatment was instituted. This consisted in the giving of mineral oil, after a period of fasting of about twelve hours, followed by powdered areca nut. In each case six grains of the areca nut were given, the animal at that time weighing about five pounds.

Three treatments were given, with results as indicated.

June 12, 1921	5 tapeworms passed
June 24, 1921	17 tapeworms passed
July 4, 1921	1 tapeworm passed
	3 <i>Belascaris cati</i> passed

On each occasion the tapeworms were passed about half an hour after administration of the areca nut. They were identified as *Dipylidium caninum*. In no case did they show the least signs of life, but were wholly normal in appearance. All of the chains were long, the longest measuring some 12 inches.

During the late summer of 1921 fleas appeared on the cat, and became quite abundant. They were not in evidence in the ensuing winter, but a few must have remained, for in July and August, 1922, the cat became badly infested, and from 50 to 100 fleas were picked off each day. An examination was made of the floors of the dwelling place and great numbers of larval fleas were found. These were destroyed by spraying their harbouring places with xylol. The presumption, as we have seen, is that all the fleas ever present on the animal were derived from those present in May 1921, and that they were continually present,

¹Contribution from the Bureau of Animal Industry of the Pennsylvania Department of Agriculture. New Series No. 12.

although in winter in very small numbers.

After the treatment of July 4th, 1921, there was no evidence of the presence of tapeworms for about a year. But in July, 1922, the cat developed a diarrhea, and tapeworm segments were noted in the feces. On July 26, 1922, areca nut was administered, and nine tapeworms were passed, these ranging in length from one-half to three-quarters of an inch.

It was known that the areca nut used on this occasion had been ground for several years. In consequence, it was under suspicion of having lost its efficacy, and it quickly became evident that this suspicion was warranted. Tapeworm segments reappeared in the feces, which continued to be very thin, being about of the consistency of pea soup. This condition of the feces was credited to the presence of tapeworms but, as developed later, there is doubt that this is wholly correct.

The number of tapeworm segments increased, and on September 1, 1922, the cat was again dosed with areca nut, the amount used being twenty grains. As a result, 149 worms were passed. These were throughout small, the chains not being above 3 inches long.

The diarrhea continued and in a short time segments reappeared in the feces. The number of these passed indicated that the infestation was heavy. Areca nut was once more given, the date being November 25, 1922. The administration followed a fast of 13 hours. The quantity used was 21 grains, and it was known that the material had only recently been ground. The cat at this time weighed between ten and eleven pounds.

Forty minutes later the cat passed a great mass of tapeworms containing, by actual count, 676 chains. Many of these, however, were very short, measuring from less than one-half to one and one-half inches. It was also noticeable that normal and normal-sized segments were scarce. There were a few chains perhaps 4 to 5 inches long, but in these most of the segments were small, with a disposition toward being misshapen. The characteristic 'cucumber-seed' aspect was not in evidence.

Attention should also be called to the fact that the 676 chains counted were not all that the cat passed. The treatment was apparently quite severe, and for the next hour the cat seemed to have a constant desire to defecate, passing frequently a small quantity of liquid fecal matter which on each occasion contained one or more tape worms. This was done wherever the animal happened to be at the time, and such specimens were lost. This

trouble was not noticed on any of the previous treatments and is probably due primarily to the greater freshness of the areca nut, although the very heavy infestation may have played its part. The animal was noticeably thinner after passing this mass of worms than before, which is after all not surprising.

Although there was no great expectation that the cat had been absolutely cleared of tape-worms, the diarrhea, after a couple of days, wholly ceased, the feces becoming normal. It was also noted that the cat's appetite fell off quite appreciably, doubtless as a result of being relieved of the task of feeding so many unwelcome guests.

For a time all went well, but after about a month segments again appeared. It is taken for granted that these came from worms which the treatment of November 25th failed to clear, and not from a fresh infestation. Fleas were probably still present, but in such small numbers that attempts to find them were almost always futile. Nor, as during the previous winter, did the cat ever show any signs of being annoyed.

Finally, January 28, 1923, areca nut was once more given. Only milk was allowed on the previous day, and nothing at all on the day the anthelmintic was administered. It was, however, given in the morning. The dose was 18 grains, or three grains less than the 21 grains administered November 25. As already noted, the after effects of the treatment had been severe and it was believed that a smaller dose would suffice. As a result, 19 tape-worms were passed, nearly all at one movement, 35 minutes after administration. The longest of these chains measured 7 inches, the shortest about one and one-quarter, but most of them were closer to the maximum than to the minimum.

It is to be noted from the data given that when the worms passed were few in numbers, they were of approximately normal length. On the other hand, in the two heavy passages, the worms were all small, this being especially noticeable in that of November 25, where many of the chains were less than a half-inch in length. The explanation, of course, is very obvious. It is merely a matter of room, and several hundred tapeworms in the intestine of a cat do not have the space necessary to allow them to produce chains of any length.

The dates of the several treatments, and the numbers of tape-worms passed on each occasion are here given:

June 12, 1921	5
June 24, 1921	17

July 4, 1921	1
July 26, 1922	9
Sept. 1, 1922	149
Nov. 25, 1922	676
Jan. 28, 1923	19
Total	876

We clearly have there a case of a vicious cycle. The animal is so closely confined to the house that it cannot be supposed that it has been reinfected from other cats. It is much more likely that the treatments of 1921 left one or more tapeworms within its intestine. The eggs of these, adhering to the region of the anus, were swallowed by fleas. These fleas with their contained bladder-worms, were then eaten by the cat. In this way the intestinal infestation was increased, yielding more eggs to be eaten by the fleas, and so on. It would be of some interest to ascertain if a cycle circle of this sort can perpetuate itself indefinitely, for it is at least possible that the constant in-breeding might have its effects on the fleas, or tapeworms or both.

But perhaps the most remarkable feature of the whole case was that, apart from the diarrhea, the cat did not show the slightest sign of being troubled. It has throughout been very active and playful, and during the winter, its fur is very thick and smooth. Moreover, although after the treatments of September 1 and November 25, the diarrhea ceased for several days, it again established itself, and it has more recently been found to be dependent on the diet. When only meat is given, the feces are normal, to become liquid after the feeding of milk for a day or two. While not denying that the presence of so many tapeworms had its effect, it is believed that the diet was the more important factor. For during the period when the tapeworms were so abundant, the cat was receiving milk as well as meat.

This apparent harmlessness of even a very heavy infestation of tapeworms may readily, of course, be an individual peculiarity and it would not be advisable to apply it to all cats. Moreover, and this is the more important point, it is applicable only to this particular tapeworm, *Dipylidium caninum*. Thus *Taenia crassicolis* (*T. taeniaeformis*), the bladder-worm of which is the familiar *Cysticercus fasciolaris* of the liver of rats and mice, is very dangerous to cats, and infestations usually result fatally. Other tapeworms are also at times found in cats, but not a great deal appears to be known as to their effects.

TECHNIQUE FOR THE TREATMENT OF STOMACH WORMS IN SHEEP¹

*By F. E. STILES,
Battle Creek, Michigan*

Up until the present time I have been a little timid about recommending any medicinal treatment for sheep, because we thought it was such a task to give the treatment. I have devised a method, however, that seems practical to me in my work, and I am going to give you a sort of a case report, and outline the method I use in preparing and administering the treatment and the results obtained.

To begin with, the most prominent symptom of stomach worms, in the ordinary flock, is that the lambs, some of them at least, are not doing well and have a rough, dry coat. Occasionally, several of the lambs show a kind of swelling beneath the lower jaw, and diarrhea is a common symptom. The lambs which are badly infected are pretty badly soiled, posteriorly, as a rule. Emaciation is also noticeable. On those symptoms I think a man can base a pretty fair diagnosis.

Last year I had a client who brought in about 880 lambs, bought in the Chicago stockyards,—Ohio, Indiana, and Michigan lambs. A few days after they were brought home they began to tip off, two or three a day. My first impression was that probably it was due, in part, to the dipping received in going through the stockyards, because some of them showed quite typical lung lesions. I advised him to turn them into pastures where no sheep had been at all during the summer and where conditions seemed favorable. Still these lambs kept tipping off, even after several days. If they had had stockyards fever, it should have cleared up by that time.

To satisfy the owner as well as myself, I called upon our State Department and Dr. Clark came down. I had found a great many stomach worms in these sheep, and it was a question in my mind whether the trouble came from the stomach worms or from going through the stockyards. Dr. Clark was satisfied that the stomach worms were probably at the bottom of the trouble.

I used the copper sulphate treatment. I boil up about four ounces of copper sulphate in a pint of water, and that makes my

¹Presented before the forty-first annual meeting of the Michigan State Veterinary Medical Association, East Lansing, Mich., February 6-7, 1923.

stock solution. This is added to three gallons of water. To the lambs I gave only one and one-half ounces. Before we got to treat the flock, about one hundred lambs had been lost. About seventy-five were weak and emaciated. They had to load them on hay racks and draw them in. I told the owner that about twenty-five percent of the 75 lambs would die anyhow, but only about ten or twelve more died after the treatment was started. Out of the balance of the flock, there was a carload of them sent to Detroit in the fall, to the Fat Stock Show, in December, and they took first prize and brought the owner the neat little sum of twenty-five cents per pound.

The way we proceeded in treating these lambs was to get them into the barn and crowd them up together. Then, with two men to catch them, one man holding and one man pouring the solution, I was able to treat about one hundred lambs an hour, and it did not make very much of a job at that. I took a funnel and had a piece of tubing attached to it. For a tip on the funnel, to put into the sheep's mouth, I used a metal, dose-syringe tip. In handling and dosing sheep, the man who holds the sheep should stand a-straddle of them and put his hands around the breast of the sheep and have him backed up against something. That will avoid struggling and will keep them standing squarely on the ground. After getting the solution ready, we had one man fill the funnel. First I started using a little stop-cock, but it was altogether too slow, so I just used my thumb. The man administers the medicine with the tube in his hand and the lambs will commence swallowing the solution. Then just stick your thumb over the end of the tube and withdraw it, and by that time another lamb is ready.

I treated about five thousand lambs last fall and had never treated any before that. I found this method very satisfactory. I tried some nicotine mixtures, with the copper sulphate, and could not see any difference. I tried giving some of them extremely large doses, but there were no ill effects. After treating this first flock, the man was so well pleased that he went to Chicago and bought about four hundred more. These were native lambs and we took from them about a dozen of the best looking ones, slaughtered them, and every one had stomach worms, some of them in large numbers. Then we treated the bunch and in thirty-six hours after the treatment we slaughtered another dozen lambs and only three of them showed any stomach worms and those only a few. After further treating we slaughtered

more, and found only a trace of stomach worms in a few of them. The lambs stopped dying.

At Bellevue, I treated some lambs and picked out about eighty which were emaciated. We left them by themselves until the next morning and had them tagged. The next day but one, after giving them the treatment, the man told me that the lambs had passed whole handfuls of worms. That led me to think that the worms must be tape-worms.

I would say to you, without any hesitancy at all, that the copper sulphate treatment for stomach worms in our native lambs just stands between profit and loss for the average farmer. It is so simple to give, and so cheap and efficient that I have become quite enthusiastic about it. You know that veterinary practice is changing so, unless we know a little about all these different things we are somewhat limited. Parasites seem to be very important and I would recommend this treatment.

There is one other thing which I might mention. If you go to the farm and examine some of these sheep and want to demonstrate the worms to the farmer, do not take a sheep which has died several days ago. Take a live sheep, bleed him and post him, and you can usually demonstrate the stomach worms. After the sheep has been dead a day or two you cannot notice the worms, as they will have been digested or have disappeared in some other way.

Plan To Go To Montreal, August 27-31.

BEAVERS A MENACE

Depredations of beaver in the Adirondacks region of New York have made necessary a law providing that the Conservation Commission be authorized to regulate the taking of beaver, in traps only, between March 1 and March 31. At one time the beaver was extinct in New York. A few were obtained and since then these forest rodents have multiplied so rapidly and have cut down so many trees and flooded so much territory that they have rendered valueless many large tracts of forest and farm land.—*Dearborn Independent*.

We Want 5000 Members This Year.

THE LOSS FROM ANIMAL DISEASE IS DIMINISHING¹

By H. J. WATERS, *Kansas City, Kans.*

Managing Editor, The Weekly Kansas City Star.

Without stopping to make a definite reckoning, few of us realize the rapid progress that is being made in reducing the loss of livestock from disease. We need to go back only a few years to find an untrained, unscientific horse doctor as the only aid the farmer had when his animals became ill. The veterinarian of that time was a strange admixture of prejudice, superstition and tradition; the veterinarian of today is a practical scientist. Then when a highly contagious disease like hog cholera or blackleg broke out in the herd the farmer was totally helpless; all he could do was to watch his animals die. Now he calls a veterinarian, who administers a serum and the disease is under control. Better still, the forethoughtful farmer has his animals immunized before they become ill and these destructive diseases are held in complete check.

Fortunately in that earlier day our animals had plenty of room. our farms were infected to a less degree by diseases and parasites and there was less chance of contracting diseases than now. It is safe to say that if we had no better control of animal diseases and parasites today than we had then we could not maintain our livestock industry on its present intensive scale.

Illustrating concretely the effect of our progress in controlling animal diseases the year book of the Department of Agriculture for 1922, just off the press, states the annual loss of horses from diseases has been reduced from 22.3 per thousand in 1895 to 16 in a thousand in 1922. At this reduced rate of loss 150,000 fewer horses and mules die from disease in the United States a year now than died thirty years ago. Assuming an average of \$50 a head as a conservative estimate the saving at this point alone amounts to 7½ million dollars. This saving is not made once in a lifetime, but every year, and it is growing greater because the losses are becoming smaller as time goes on.

Not all of this saving, of course, is due directly to the ministrations of the veterinarian, for the horseman has in the meantime acquired much knowledge of sanitation and provides better conditions for his horses and mules and feeds them more in-

¹Reprinted from The Weekly Kansas City Star.

telligently than before. Yet this is another phase of the influence of veterinary medicine on farm practices.

In the loss of hogs from diseases and parasites the reduction has been even greater, as would be expected. In 1895, 92 3 hogs out of every thousand died of disease; in 1922 this loss was 54.4 a thousand. In 1896 the loss reached the high point of 127 per thousand and in 1911 fell as low as 41 a thousand. This means a saving of some $2\frac{1}{4}$ million hogs a year from death due to the complete control we now have over hog cholera and to better methods of sanitation. These hogs have a value on a conservative estimate of some 20 million dollars. Of more consequence than the aggregate value is the effect upon the individual hog raiser. Now that we can control hog cholera, the tenant farmer or the man of small means is able to raise a bunch of hogs without fear of losing them after he has invested his year's corn crop in them.

If all the savings caused by the practicing veterinarian were added together a staggering total would be reached. Of even more importance than this saving is the service of the veterinarian in conserving the health of the human family. It is not much to expect of medical science that the insidious disease, tuberculosis, may ultimately be stamped out of our country, but it cannot be accomplished without the help of the veterinarian. Be it said to the credit of the veterinarians that they have been leaders in the movement to make the United States free of tuberculosis.

We do well, therefore, to honor the veterinary profession. We do well to support generously the colleges educating men for this important profession, that they may be more scientific and more practical in their practices and that they may be of the highest type of citizen. We are merely promoting our own welfare when we give generous encouragement and support to the patient workers in the veterinary laboratories in the colleges and the Department of Agriculture where the discoveries were made upon which this new science is based and where discoveries are being made that will determine the progress of this indispensable service to agriculture.

Does Your Wife Know About The Women's Auxiliary?

INFECTIOUS VENEREAL GRANULOMATA OF DOGS¹

By ALEXANDER GLASS, *Philadelphia, Pa.*

This disease was brought to this country about twenty years ago and was confined at first to English bulldogs. About this time there appeared a number of advertisements offering dogs at greatly reduced figures. On investigation, such imported dogs were found to be hopelessly affected with venereal granulomata. The disease gradually spread to the Boston terrier and played havoc with the stud dogs of this breed, and today it is found in other dogs as well, particularly the pointer and setter.

As this disease is perpetuated by mating infected animals and because of the enormous losses in high-priced dogs, it seems to the writer that some action should be taken by the regulatory authorities and kennel clubs to put this disease in the same category as other infectious diseases such as glanders, tuberculosis, etc.

In the male, the disease first appears as dark purple tumefactions on the body of the penis. These enlargements are usually circumscribed, although they occasionally may be diffuse from the onset. There is invariably a bloody but non-purulent discharge from the prepuce. This must not be confounded with preputial catarrh so common in many dogs that are over-fed and have little exercise.

As the disease advances, the tumefied growths gradually assume a granular appearance, become enlarged and bleed on the slightest touch. To reach this stage of advancement may require several months. The tumefactions are almost invariably sessile, although in the male they sometimes are pedunculated.

The disease may spread to adjacent parts, including the prepuce, perivaginal tissue, etc., and sometimes by metastasis involve the inguinal and other adjacent lymph glands.

The veterinarian should exercise the utmost caution in examining suspected animals, because occasionally—in the male particularly—there may be but one granulation which may often be situated so far back on the penis or hidden in the folds of the prepuce as to escape notice.

Such a condition may exist for months or even years; nevertheless the animal is a spreader of the disease during this time, because copulation is possible without pain.

¹Reprinted from Univ. of Penna. Veterinary Extension Quarterly No. 10.

In the bitch the vaginal mucosa and underlying tissues in advanced cases may be so involved that finally cicatricial tissue brings about an occlusion of the passage so that it is impossible for copulation to take place. This condition may be readily determined by digital exploration.

The breeder's attention is sometimes first drawn to this disease in bitches—even when they are but slightly affected—by the male's refusal to copulate.

When the diagnosis is difficult or uncertain, inoculation of laboratory animals may be resorted to with definite results.

Histopathologically the disease shows a proliferation of the connective tissue, with many endothelial cells scattered throughout. The outer tissue is concentrically formed and contains epithelial-like cells and a few plasma cells.

It is questionable whether the tumor is a sarcoma or endothelioma, but most observers are generally agreed that it has none of the true characteristics of carcinoma.

As to treatment, the growths if they are of recent origin can be removed with the knife followed by actual cautery deeply applied. Adjacent enlarged lymphatics as well as large portions of the vaginal and penial tissue may be removed surgically, but a common-sense résumé of this disease leads to the conviction that surgical interference is useless and that animals so infected are never cured, but are always a menace to other dogs whether they are bred or not. Therefore it is obvious that all such animals should be destroyed.

ALEXANDER GLASS.

We Want 5000 Members This Year.

VISITORS AT THE JOURNAL OFFICE

Among those who have dropped in to see the Secretary-Editor during the past few weeks were: Dr. Edward A. Cahill, Laboratory Director, and Mr. F. V. Hawkins, Director of Veterinary Department, Pitman-Moore Co., Indianapolis, Indiana; Dr. M. J. Smead, of Rochester, Mich.; Dr. Joseph Hawkins, Dr. Daniel Marks, Dr. A. Stanley Schlingman and Dr. John Hoberg, all of Detroit.

Plan To Go To Montreal, August 27-31.

TRANSIENT PARALYSIS OR LEG WEAKNESS IN PULLETS¹

By A. B. WICKWARE

Pathologist, Department of Agriculture, Ottawa, Can.

This affection takes the form of a weakness of the legs which in a few cases results in a complete paralysis of that portion of the body.

The disorder is principally observed amongst pullets, but other fowls may likewise be affected. Cockerels rarely, if ever, suffer from this condition.

Leg-weakness or what may be termed transient paralysis is particularly prevalent during the months of December, January, February and March and there appears to be a definite relationship between this affection and the heavy production of eggs which occurs at this period.

The usual history of an outbreak is that the owner, upon visiting the pen during the afternoon or evening, has failed to observe anything abnormal about his fowls. Upon entering the pen the following morning he is surprised to see a bird stretched out on the floor of the fowl house, occasionally making a determined but futile effort to stand upon its feet. The bird appears to be paralyzed, sometimes only one leg being affected, but in the majority of cases there is an involvement of both limbs. Upon being approached the affected individual beats wildly with the wings as it endeavors to get out of the way and in this fluttering it is frequently propelled for a considerable distance.

The fowls do not appear to be depressed but exhibit signs of considerable agitation when picked up.

In the majority of cases a complete recovery of nine out of every ten birds takes place in from 12 to 48 hours without treatment of any kind. Occasionally a fowl will remain in this paralytic state for a longer period of time and in our experience it has been found that where the condition persists for over three or four days a permanent paralysis results which resists all attempts at treatment.

Investigations have been conducted with the object of determining the exact cause of the trouble but very little information of a helpful nature has been acquired.

¹Reprinted from Canadian Veterinary Record, iv (1923) 2, pp. 123-124.

The most plausible theory is that of pressure upon the nerves supplying energy to the limbs by an unusually large egg or the continued irritation induced by a temporary stoppage of the egg in the oviduct. This theory is further upheld by the fact that fowls in this condition will recover almost immediately after laying. There are some cases, however, which do not appear to be dependent upon pressure as observations have shown that the fowls were not producing at this time. Possibly a few cases may be due to intestinal worms which exert their harmful effect when the strain of egg-laying has somewhat lessened the birds' resistance.

That the condition is not the result of forced feeding or the lack of some essential substance in the diet is apparent from the fact that leg weakness is transitory and fowls make a complete recovery without any change of diet.

There is possibility that a predisposition to leg-weakness is transmitted from a parent, subject to this disorder, to her offspring, but to eliminate or confirm such a suspicion, selective breeding would have to be carried on for a period of at least five years.

While leg-weakness at first sight is rather alarming, no great concern need to be felt by breeders, providing the birds appear to be vigorous and healthy and are laying well. The only thing one can do from a curative standpoint is to administer a teaspoonful of Epsom salts to each fowl after isolating her from the flock to prevent injury by the other birds. It is also advisable to cut down on the daily allowance of scratch grain and give a greater proportion of mash mixed to a crumbly consistency or even fairly moist.

When the condition persists for more than three days it is advisable to kill the bird and use the carcass for food purposes as there is nothing infectious or injurious in the flesh of such a fowl.

Have You Secured One New Member This Year?

The Veterinary Medical Association of the First District of Ohio has a committee working on the drafting of a new veterinary practice act for Ohio, the same to be submitted to the Ohio State Veterinary Medical Association, for approval, at the next annual meeting.

CLINICAL AND CASE REPORTS

(Practitioners and others are invited to contribute to this department reports of unusual and interesting cases which may be helpful to others in the profession.)

ADENOLEIOMYOMATA IN A COW

By R. A. CRAIG and L. P. DOYLE,

Purdue University Agricultural Experiment Station

Veterinary Department

Lafayette, Ind.

This case occurred in the practice of Drs. Smith and Scripture, Frankfort, Indiana.

The affected animal was a grade Jersey cow 7 years of age. The first symptoms noted by the owner were decrease of milk flow and loss of appetite. The attending veterinarian was immediately called, and two weeks later the writers were invited to visit the case. At this time the cow showed marked emaciation and weakness. Large patches of skin over the hips, lateral surfaces



Photograph of cow showing gangrenous area of skin in region of thigh and leg.

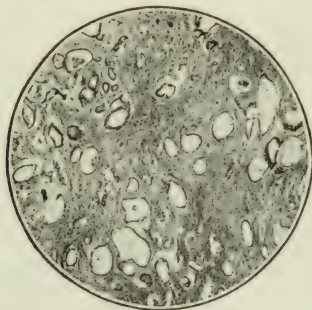
of the thighs and legs, and poll of head, had become gangrenous. The teats, eyelids, conjunctiva, and tongue also showed gangrenous surfaces.

The cow was killed and the carcass removed to a nearby reduction plant. The post-mortem examination showed the following:

The liver weighed 31 kilograms. This increase in size and weight was due to a large number of nearly-white, firm, nodular masses varying from 3 to 60 millimeters in diameter, scattered throughout the glandular tissue. These nodules, when cut through, were free from caseous material, and appeared dense with a few clear hyaline areas. The omentum and peritoneum, especially the parietal peritoneum, were studded with nodules similar to those in the liver. Here, however, none of the nodules exceeded 8 millimeters in diameter. The other viscera, and the visceral and body lymph glands were apparently normal.

HISTOLOGIC EXAMINATION

Microscopic sections of the nodules from the liver, omentum, and peritoneum, showed the presence of a neoplasm of unusual structure, at least unusual in these regions of the body. In the tumors from all three sources the adenomatous feature was conspicuous. There were numerous acini or follicles lined with



Section of tumor from the omentum, showing the epithelial-lined follicles, separated by connective tissue interspersed with some plain muscle fibers.

cuboidal epithelium. Between the follicles in the tumors from the liver there was a preponderance of unstriated muscle made up of short, plump cells. The tumors from the omentum and peritoneum showed a preponderance of connective tissue between the follicles.

In the tumors from the liver there was a great deal of mucoid material that had evidently originated from degeneration of the epithelium of some of the follicles. While the epithelium of the follicles usually consisted of a single layer, there were areas in

the tumors from the liver in which the follicular epithelium showed evidence of proliferation suggesting an approach to the carcinomatous stage. However, there was not any evidence of infiltration of the surrounding tissue.

Microscopic sections of the gangrenous tongue, skin, teats, and udder, did not show the presence of the neoplasm.

Does Your Wife Know About The Women's Auxiliary?

FORTY YEARS IN SERVICE

The accompanying photograph shows a remarkable pair of mules, Mag and Brag, broken at the ages of 3 and 4 years, respectively, in 1883. They have been in the possession of their present owner, Bill Malone, a drayman, of Augusta, Ark., all



these years. They are working together every day, and a J. I. C. bit is required for Brag. In the spring of 1919 an offer of \$350.00 for this team was refused by the owner. Compare this sort of power with gasoline. Photograph kindly supplied by Dr. E. L. Kittrell, of Augusta, Ark.

REVIEWS

ENCYCLOPEDIA OF VETERINARY MEDICINE, SURGERY AND OBSTETRICS. Edited by George H. Wooldridge, F. R. C. V. S., M. R. I. A., F. Z. S., Professor of Medicine and Hygiene, Royal Veterinary College, London, etc., Two volumes. I, Veterinary Medicine; II, Surgery and Obstetrics. Pages 1106. 356 figures, 2 plates in color. Published by Henry Frowde and Hodder & Stoughton, London, 1923. \$40.00

So far as we are aware, this is the first veterinary encyclopedia, so called, to come from the press. It appears to be intended to occupy a sort of middle ground, however, to perform a dual purpose, as it were. Such an impression of this work is obtained from a statement on the wrapper, to the effect that "the book has a wide appeal." Veterinary surgeons will find it an unfailing and trustworthy book of reference, To stock-owners and breeders it should prove of great interest and practical value, its language being, as far as possible, easily understood by non-professional readers." First impressions are apt to be most lasting. Perhaps the publishers fully appreciate this, but it is our opinion that the stock-owner and breeder will be more favorably impressed than the veterinary surgeon.

The material on the various subjects treated in this encyclopedia has been prepared by a large staff of collaborators, the names of many prominent veterinarians appearing in the list. Those best known to the profession in this country being Drs. M. Dorset and W. L. Williams, of the United States; Major C. G. Saunders and Captain E. A. Watson, of Canada; and Major Hobday, of England.

There are at least two qualifications, by which the value of a work of this kind may be measured, namely, completeness and up-to-date-ness. Perhaps we were unfortunate in applying our tests, but nevertheless, we did have two occasions to refer to this work, shortly after its receipt, and were disappointed in both cases.

An inquiry came for information concerning a disease existing in Panama, known locally as "derrengadera" or "murrina." Recalling a claim made for the book, "that all diseases occurring in foreign countries receive adequate consideration," we turned to the book for information concerning the Panama disease, but failed to find any mention of it. (In 1912, Darling published a

29-page account of this disease, which is a trypanosomiasis, in the Journal of Medical Research, with eleven illustrations.)

The next time we had occasion to refer to this work we wanted some information on the use of carbon tetrachloride in the treatment of hookworm disease. We were surprised to find that this drug was not even mentioned, in the paragraph on the treatment of ankylostomiasis, which is dismissed in fifteen lines, although a considerable bibliography is already available on the subject, one which has received much attention during recent years.

We did not wish to be unduly critical of this work, but in two practical tests it was found wanting. On the other hand there is a vast store of valuable information available. Whether it is possible, in this era of rapid scientific progress, to have an encyclopedia of this sort, which is worth the time, effort and money put into its preparation, is an open question. We rather favor the loose-leaf style of certain publishers, now in vogue in this country.

Whether such a work will supplant our standard texts and references on veterinary medicine and surgery is questionable. We reiterate our opinion that the present work will have a greater appeal for the stock-owner and breeder than the veterinarian. This is not to be taken as saying, however, that we place this work in the same class with other books which have been written primarily for this class of readers. It occupies a much higher level. It will not harm a veterinarian to have this work in his library. He will have many occasions to refer to it.

SCIENTIFIC FEEDING OF THE DOMESTIC ANIMALS. Martin Klimmer, Ph. D., D. V. M., Professor of Veterinary Hygiene in the Veterinary High School of Dresden. Third revised and enlarged edition. Authorized translation by Paul Fisher, B. S. A., D. V. M., formerly Professor of Pathological Anatomy, Ohio State University. 242 pages; 94 illustrations. Published by Alexander Eger, Chicago, 1923. Price \$3.25, cloth.

There is no subject today, which the veterinarian has neglected to the same extent as feeds and feeding. We mean those subjects which properly belong to veterinary science, of course. The feeding of animals is something which frequently spells success or failure for the man who has invested his money in live stock, or who is converting his crops into cash *via* the live stock route. More so today than ever before.

Furthermore, if veterinarians are to reap the full harvest of their opportunities, they must command a certain knowledge of the relative values of the various foodstuffs, and be able to advise their clients intelligently upon the many phases of profitable and economical feeding. This book by Dr. Klimmer contains much of value along this line. It is a companion book to his *Veterinary Hygiene*, and prepared with the same characteristic German thoroughness and attention to detail.

The subject of vitamins receives very little attention, which is surprising, in view of the great amount that has been said and written on the subject during recent years. Perhaps it is the belief of the author that our domesticated animals have little to fear from avitaminoses. He says, "Harmful effects, as a result of deficiency in vitamins, occur now and then, but only in certain species of animals."

Another important subject which appears to have been slighted is the feeding of dogs. The grossest ignorance exists, at the present, as to what a dog should or should not eat. The subject of dietetics for canine patients suffering from various afflictions is an undeveloped field in veterinary medicine. Knowing the part diet plays in certain human diseases, typhoid fever for instance, may it not be that a large percentage of the fatalities from canine distemper is attributable to a lack of attention to this detail (diet) in the treatment?

The subject of dog biscuits is briefly discussed. It is stated that unless these biscuits are properly constituted, "Dogs nourished on these products for any length of time inevitably suffer in health (Hanslian)." On the other hand, "Dog biscuits of proper composition may be used as exclusive feed, but are not economical." A statement implies that the best way to feed dog biscuits is to soak them in water or broth before feeding, to which exception may be taken. Biscuits should be fed dry. They act as the dog's tooth-brush, in the dry state, and stimulate a more profuse flow of saliva, than when fed soft.

Section I is devoted to feeding stuffs and goes into their chemical composition, conservation and preparation. Section II treats of the principles of nutrition and feeding, contains rations for work animals, growing animals, milk, pork, beef and egg production, even feed for fish. There is a great deal of information that makes the book a valuable one for reference, for any veterinarian in general practice. It is a distinct addition to our literature.

THE PIG BOOK FOR BOYS AND GIRLS. William W. Smith, M. S. A. Professor of Animal Husbandry, Purdue University. 171 pages, 42 illustrations. Published by J. B. Lippincott Co., Philadelphia, 1923. Price \$1.25, cloth.

This little book might be described as a short course on pig raising. It treats on a small scale, but in a systematic way, all the factors which contribute toward successful swine husbandry. The difficult problems are handled simply and efficiently. For instance, the subject of swine diseases is approached and disposed of in a way that will not be objected to by veterinarians. Lice, worms and scours only are referred to. The usual santolin and calomel combination is mentioned. Patent stock feeds, tonics and conditioners are said to be expensive and unnecessary.

The author advises that "If the pig is sick his trouble should be diagnosed by a veterinarian and his particular ills prescribed for," in which advice we concur. We do not endorse, however, his unqualified recommendation for the permanent immunization of pigs, by the serum-virus treatment, for the reason that there are localities in the country free from cholera, and several states forbid the use of virus in such territory. On the whole, the author has handled a difficult subject admirably well. Here is a little book that will make a nice present for that rosy-checked, freckle-faced farm boy or girl, the son or daughter of a particularly good client of some veterinarian.

REST AND OTHER THINGS. Allen K. Krause, A. M., M. D., Associate Professor of Medicine, Johns Hopkins University. First edition. Pages 159. Published by Williams & Wilkins, Baltimore, 1923. Price \$1.50, cloth.

A collection of eight papers, written in the sympathetic style of the author. I. Rest. II. The Treatment of Tuberculosis. III. Sputum Infection of Children. IV. Adult Tuberculosis from Childhood Infection and Its Prevention. V. Antituberculosis Measures. VI. The Tuberculosis Problem. VII. The Elements of an Adequate Tuberculosis Program. VIII. Some Problems of Medical Education in Tuberculosis.

Although written from the standpoint of human tuberculosis, this book has its interest for veterinarians, particularly those engaged in tuberculosis eradication. How often does it happen that a veterinarian is approached by some timid member of the household, during a short stay at the home of the owner of a herd under test, and is asked questions about tuberculosis, that

would not be asked of the family physician. The veterinarian is looked upon as an authority on this disease, and he should be posted on all phases of it. Get this book and stick it in your pocket. It will make interesting reading between spells.

ABSTRACTS

SAFETY OF LOCAL ANESTHETICS, WITH PARTICULAR REFERENCE TO COCAINE AND BUTYN. Carl Nielsen and John A Higgins. Jour. of Lab. and Clin. Med., VIII, 7, April 1923.

Butyn having been demonstrated superior in efficiency to cocaine and procaine, the authors conducted a series of experiments with a view to comparing the toxicity of butyn to that of cocaine. These tests involved the subcutaneous injection of the drug into white rats, its subcutaneous and intravenous injection into rabbits, cats and dogs, and its oral administration to cats. Further, comparative tests to determine the effect of the two drugs on blood pressure and respiration were made.

A vast difference in relative ratio of toxicity of these anesthetics, according to the animals used and the mode of administration, was noted. Using cocaine as a standard for toxicity, it was found that butyn administered subcutaneously was twice as toxic as cocaine for rats, $3 \frac{2}{3}$ times as toxic for rabbits, about equal in toxicity for cats, and slightly less toxic than cocaine for dogs. Butyn given intravenously to rabbits, and intravenously and orally to cats, appeared about equal in toxicity to cocaine. It is pointed out, however, that the apparent variation in the ratios of toxicity of butyn compared to cocaine, is due mainly to the great variation in toxicity of cocaine for various animals, and the conclusion is reached that the safety of a local anesthetic for human use should not be measured by comparison of its toxicity with that of cocaine on experiment animals.

In determining the toxicity of a local anesthetic, the authors conclude that it should be tested on as many different species of animals as possible, preferably the higher experimental animals, and that its toxicity should not be measured by comparison with cocaine as a standard without taking into consideration the fact that cocaine is highly selective in toxicity, bearing in mind that the higher the development of the brain of the animal, the more toxic is cocaine. The comparative variation in toxicity, depending upon the species of animal, mode of administration, concentration of solution, rate of injection, rate of absorption, as well

as the comparative action on blood pressure and respiration, should be considered. Then, with these data in mind, it is concluded that final judgment on the safety of the drug should be passed only after sufficient clinical experience with it.

The authors also investigated various drugs for their detoxicating action in the treatment and prevention of poisoning from local anesthetics of the "cocaine group." They obtained excellent results from the use of pituitary extract and indicate that small doses of pituitary extract, administered simultaneously with the anesthetizing agent, should prove an important adjunct. In treating cases of poisoning from anesthetics of the "cocaine group" the pituitary solution should be administered intravenously. In experiments on dogs, reported by the authors, high sublethal doses of butyn, which, if administered alone, would have caused marked symptoms of poisoning, were tolerated with but little discomfort when given with 1/100 to 1/45 of a cubic centimeter of commercial pituitary solution.

R. A. K

TAPEWORM PARASITES OF DOGS IN THE PUNJAB. G. Sondhi.

Parasitology [Cambridge, Eng.], XV, 1, March 1923, pp. 59-66, text figs. 1-3, pl. II, figs. 1-5.

This paper is based on material collected from pariah dogs in Lahore, India. The species reported are as follows:

Dipylidium walkeri Sondhi, 1923. Head 263-361 μ in diameter with rostellum invaginated; 185 μ with rostellum evaginated. Rostellum elongated, 63-100 μ in diameter, with 6 to 7 alternating circlets of rose-thorn shaped hooks. Hooks gradually decreasing in size from anterior to posterior row; anterior up to 12 μ long; posterior as little as 2 μ long. Suckers circular, 118-150 μ in diameter. Neck short. Strobilus thin, 10-28 cm. long. Mature segments at least three times as long as wide; gravid segments 4.5-8 cm. [misprint for 4.5-8 mm.?] long by 1.5-2.5 mm. wide. Genital pores slightly pre-equatorial in immature segments; equatorial or slightly post-equatorial in mature and gravid segments. *Male genitalia*: Approximately 225 ovoid testes in each mature segment, occasionally extending lateral of longitudinal excretory vessels, absent from a small anterior area, and few, 10-15, in field between pairs of female genital glands. Cirrus 45-54 μ long by 14-21 μ wide. Cirrus pouch may or may not extend to lateral excretory vessels. *Female genitalia*: Ovaries diffuse structures extending from level of genital pores to vitellar-

ia, and divided by vagina into a larger inner and a smaller outer lobe. Each vitellarium has the appearance of a bunch of grapes and is usually larger than the outer lobe of ovary. Egg capsules contain 1-15 eggs and extend beyond lateral excretory vessels, with a clear area anteriorly and a smaller one posteriorly. Eggs approximately $35\ \mu$ in diameter; the shell $4\ \mu$ thick.

Dipylidium sexcoronatum. Sondhi finds over 200 testes in this species, previous writers reporting 130-140. This species has been previously reported only from Hungary and the United States. In a footnote Sondhi reports it from dogs in England.

Dipylidium oerleyi. This is the first record from the dog and the first from India, the only previous record being from the cat in Hungary. Specimens from the dog are 9.5-21.5 cm. long; specimens described by von Ratz from the cat were 5-11 cm. long. This species was less common in Lahore than the 2 preceding species of *Dipylidium*.

Multiceps multiceps. Sondhi finds that genital primordia first appear as small dots in twenty-fifth segment; he finds 120-150 testes, previous writers reporting 200; the base of the vitellarium rests on the transverse excretory canal [See comment on *M. gaigeri*, below]; the vagina in passing between the ovaries crosses the uterus in about half the segments.

Multiceps gaigeri. In mature segments Sondi finds approximately 160 testes, not 200-225 as described by Hall; the base of the vitellarium rests on the transverse excretory canal. [This relationship may be modified by the degree and direction of pressure in mounting specimens. This is the first record, apparently, of the adult worm in natural infestations, the adult worms originally described being developed by experimental feeding of larvae to dogs. M. C. H.]

Multiceps serialis. [By a printer's error this appears in Sondhi's article as *Multiceps serialis*.] Sondhi notes that Gaiger and Southwell reported this species from India, but that Hall regards their specimens as *M. gaigeri*. [Their specimens of larvae from goats must be so regarded; Southwell's specimens from the dog in Ceylon may have been *M. serialis*.] Sondhi thinks *M. serialis* is not uncommon in India and says: "The prevalence of the wild hare I think indicates the possibility of its being the intermediate host."

Taenia hydatigena. Sondhi states that the testes extend inward dorsally to the outer borders of the ovaries, between the

ovaries and the vitellarium, and dorsal to the vitellarium. A fairly common species in India.

Taenia ovis. This species was found in one animal. [This is the first report of the adult tapeworm in a natural infestation, the only other report being Ransom's cases of the development of the adult worm by experimental feeding of the larvae. M. C. H.] It is the first report of the species in any stage from Asia.

Echinococcus granulosus. The adult tapeworms were found in one dog.

M. C. H.

STUDY OF AN ORGANISM RESEMBLING *BACT. PULLORUM* FROM UNABSORBED YOLK OF CHICKS "DEAD IN SHELL." F. R. Beaudette, L. D. Bushnell and L. F. Payne. Jour. Inf. Dis. XXXII, 2, 124.

The attention of the authors was called to the fact that a large percentage of eggs under artificial cultivation at a poultry plant failed to hatch. This condition was known to exist generally in all such establishment.

Thinking, perhaps, that a condition existed in this plant similar to that described by Pernot, of the Oregon Agricultural Experiment Station, they made a bacteriologic study of the problem.

They were able to isolate, from the unabsorbed yolk of some of the chicks "dead in the shell," an organism closely related to members of the colon-typhoid group and which can not be distinguished from *Bact. pullorum* by fermentation reactions, except by the inconstant reaction of the latter on maltose and xylose.

They also found the organisms to be constant in eggs from the same hen which suggests the possibility that the hen may be a chronic carrier of the infection.

From their experiments, this organism and other members of the colon-typhoid group appeared to be pathogenic for developing embryos.

S. S.

During the year 1922, approximately 103,000,000,000 pounds of milk were used in the United States, in the production of butter, cheese, ice cream, milk chocolate and other milk products. A little less than one-half this amount, 47,000,000,000 pounds, was consumed as milk. This is about 945 pounds of milk, in some form, for each man, woman and child in the United States.

AMERICAN VETERINARY MEDICAL ASSOCIATION
Proceedings of Fifty-ninth Annual Meeting, St. Louis, Mo.
August 28 to September 1, 1922

(Continued)

LARGE-ANIMAL CLINIC
THURSDAY MORNING, AUGUST 31, 1922

(Continued from p. 387 May Journal)

CHAIRMAN KINGMAN: We will now listen to a few words from Dr. Eichhorn, regarding "Swine Erysipelas." Dr. Eichhorn. (Applause).

DR. EICHHORN: Swine erysipelas, while a very important disease abroad, occurring practically in every country of Europe, has only in a very few instances been found to occur in the United States. However, in the last few years the etiological factor of the disease, which is the *Bacillus erysipelatis suis*, has been isolated from chronic cases and more recently also from acute cases of young pigs, by investigators of the Bureau of Animal Industry and others. It is difficult to state to what extent the disease is prevalent in this country. In view of the more recent isolations, however, there is a possibility that this disease may become of very great importance to the hog industry of the United States, just as it is at the present time in the European countries.

It is rather unfortunate that the differentiation between swine erysipelas and some of the other infectious diseases of hogs is somewhat difficult. Especially is this the case in the acute form of erysipelas. We are even now confronted with certain difficulties in differentiating the various swine diseases, and with the mass of written material at hand, and also in spite of the frequent and thorough discussions at the various meetings, on differential diagnosis of swine diseases, the practitioner is even now at a loss to make definite differentiation. Therefore, if, with all the confusing material, swine erysipelas would also enter into the problem, it would cause even a greater confusion than exists at the present time.

The group of organisms to which the causative factor of swine erysipelas belongs includes also other pathogenic organisms, one of these being the bacillus of mouse septicemia. This particular

strain is so close to the swine erysipelas organism that it is almost impossible to differentiate it bacteriologically and biologically. Furthermore, it is an established fact that at times the mouse septicemia organism, when inoculated into hogs, may produce typical forms of swine erysipelas, and therefore, there exists the possibility that under favorable conditions the mouse septicemia organism may change into a true swine erysipelas type. The possibilities of such occurrences were pointed out by several investigators.

It has also been established that the swine erysipelas organism is often present in normal hogs as a saprophyte, and under favorable conditions may become pathogenic, when it may cause outbreaks of the disease with the usual great losses which follow the infection.

The symptoms of the disease vary, depending on the type of the infection. There are three distinct forms recognized and which are absolutely distinct; the urticaria form which is commonly known as "diamond skin disease." Those who had experience in abattoirs in the United States no doubt have seen this form, but it has never been recognized as a type of swine erysipelas and always has been considered as an urticaria, or "diamond skin disease." The second type is the chronic form, which is manifested as a verrucose endocarditis; whereas the third type is the acute form.

Depending on the type we have to deal with, the symptoms vary. In the urticaria type we have typical rhomboid-shaped urticaria-like eruptions on the skin. The animals affected with this type usually manifest only slight symptoms for twenty-four hours after the first lesions appear. This form is not severe and the mortality is practically nil. The animals usually recover in from three to five days. The chronic form which usually follows the acute type after the animal shows an apparent recovery manifests itself in a pronounced weakness of the animal, which shows even on moderate exertion, very pronounced dyspnea.

The acute form is of the greatest importance for the veterinarian, inasmuch as the mortality from this type of infection is practically the same in European countries as from hog cholera in the United States. It is not uncommon to observe losses of from 60 to 80% in infected herds. The animals usually die in from three to five days after the first manifestations of the disease. The period of incubation is practically the same as in hog cholera. In the natural infection it is usually from three to

five days after exposure. The symptoms which the animals manifest also simulate those of hog cholera—weakness, exudate and edema of the eyes, eruptions on the skin and also reddening of the skin. However, the reddening of the skin is not the same as the discoloration in hog cholera. In hog cholera the reddening of the skin is due to distinct hemorrhages; whereas in swine erysipelas the reddening is due to the filling of the lymph spaces with serous exudate, in which the red blood corpuscles have been disintegrated, and therefore, if pressure is exerted with the thumb on the reddened spots on the skin of swine erysipelas, the reddening disappears because the reddening is not due to true hemorrhages. On the other hand in hog cholera the reddening remains, because of the true hemorrhage under the skin which cannot be dislodged; this condition being one of the important differential points between swine erysipelas and hog cholera.

As a further differentiation, hog cholera as you know has a tendency to run a more or less prolonged course. Only in exceptional cases do animals die in less than five days, but very frequently the disease runs into a subacute form with severe intestinal manifestations and pulmonary involvement which is only very exceptional in swine erysipelas. As a further differential point, on post mortem examination, we have in hog cholera the typical hemorrhages, particularly in the form of petechiae in the kidneys, on the serous membranes, etc. Whereas, in swine erysipelas, the hemorrhages are diffused, if there are any at all, and in the kidneys we have not the hemorrhagic petechiae but we have indications of a typical nephritis, that is, the whole cortex of the kidney appears darker, without the characteristic hemorrhages.

On careful observation and from postmortem examinations of the carcass, it is not very difficult to differentiate between hog cholera and swine erysipelas and it is advisable for the veterinarians to bear in mind the possibility of the occurrence of swine erysipelas and to be on the lookout for the infection. However, it behooves us not to get alarmed, especially so as we are already very much confused in regard to swine diseases, and unless we learn from authentic sources of the more frequent occurrence of swine erysipelas in this country, I do not think that veterinarians should be greatly concerned with this infection.

With regard to the control of swine erysipelas, the principles of sanitation and prophylactic vaccination are of the utmost importance. In Europe, for many, many years (I should think

for about twenty years), they have been practicing prophylactic vaccination against swine erysipelas, which consists of a simultaneous injection of immune serum together with a suspension of active cultures of the *Bacillus erysipelatis suis*. This simultaneous vaccination is very effective. So much so, that when swine erysipelas occurred very extensively in Saxony the government conducted a campaign of vaccination and guaranteed every animal against the disease after vaccination.

There is another point which I think is essential to bear in mind and that is that the disease occurs usually in young hogs; hogs over a year old are very rarely affected with swine erysipelas. Likewise, suckling pigs are not susceptible. The serum used for vaccination is produced from horses; therefore, it is very simple to produce it and only small doses are administered. The dose per hog varies from 10 to 20 cc together with $\frac{1}{2}$ to 1 cc of the culture, and this vaccination is considered very effective against the infection and is now practiced in every country where the disease is prevalent.

I thank you. (Applause).

DR. SCHWARZE: Now, gentlemen, here are the organs of these animals we just posted, and you will find one of them shows edema, quite marked in the lungs, with circumscribed pneumonic areas very similar to what you sometimes find in parasitic pneumonia. Also more or less of a bronchitis, with muco-purulent material present.

Here is the other specimen, and it shows a lung where you have more or less pneumonia present and a slight edema. You will also see the petechiae, which are very characteristic.

DR. EICHHORN: This specimen shows the form of swine erysipelas which has been observed in the United States quite frequently. The chronic form, that is, the verrucose endocarditic form, has also been observed on many occasions. In this particular specimen, however, you will note the typical rhomboidal form of eruptions on the skin. You may further observe that the reddening is not uniform as yet, but as the process continues the center becomes pale and as the healing advances the skin on the affected part becomes covered with a crust. The organisms have been isolated from such skin lesions and also from the chronic forms of swine erysipelas in this country.

CHAIRMAN KINGMAN: Dr. Hoskins has an announcement to make.

DR. HOSKINS: Turn to your programs and note the Section

on Sanitary Science and Police. Professor Smith, who was to speak first, cannot be with us tomorrow, and through the kindness of Dr. Kingman we have arranged to have Professor Smith deliver his address here this afternoon.

CHAIRMAN KINGMAN: Dr. Hart will discuss "Swine Paralysis." Dr. Hart.

Dr. Hart: I don't feel very well qualified to discuss this subject. The only reason for my substituting for Dr. Fitch is because we have a considerable amount of this disease in California, and because we have been particularly fortunate, for the last eighteen months, to have Dr. Robert Jay with the Station, working on hog diseases. He is the representative of the Bureau of Animal Industry doing educational hog cholera control work, but as every one knows, Dr. Jay is interested in every disease that has anything to do with dietary trouble.

We believe swine paralysis is a dietary trouble. I have used that word advisedly, because the word dietary in this sense covers a variety of conditions—certainly three. One of these is the over-feeding of animals with ordinary nutriment, carbohydrates, proteins and fats. We know that the hog increases its body weight faster than any other of our ordinary domestic animals. It is born weighing three or four pounds, or less, and in the course of ten months it weighs two hundred pounds. Therefore, it increases its body weight fifty to one hundred times in this short period. Its cells are, therefore, extremely susceptible to stimulus by food. This may have something to do with this trouble in hogs. It is one form of dietary trouble.

Another form of dietary trouble is the mineral intake and outgo. This is particularly important in dairy cows, and those men who are studying mineral metabolism tend to consider all dietary troubles to be due to mineral deficiency.

Then, we have the third form of dietary troubles, known as true deficiency diseases, which are due to lack of one of the vitamins. Just which one of these conditions is the cause of swine paralysis we do not know, and we do not know that any of them is the entire cause, but evidence is certainly accumulating that these factors, one or all of them, have considerable to do with the development of this disease.

Dr. Jay is very strongly of the opinion that he can stop swine paralysis without any difficulty in herds, and he is having remarkable success in the field in California, although he hasn't carried on experimentation, nor made field observations to the point that

he knows which one of these dietary troubles is the cause of the condition.

We know, for example, that in the raising of hogs, the swine husbandry men are particularly careful that there shall not develop leg-weakness or the condition termed "low in the fetlocks," as this excludes the hog from winning in the live stock shows. Therefore, they feed these hogs calcium phosphate and bone meal when they are fitting them for show, if there is a tendency for the animal to show leg-weakness, because these substances have been recommended as curative agents for this trouble in hogs. Some men, therefore, on account of the fact that animal husbandmen have used bone meal and calcium phosphate for a considerable length of time, are of the opinion that paralysis of the hind legs is simply an extension of that condition common in the swine industry and termed "low in the fetlocks." That is purely a theory. The use of calcium phosphate and bone meal has been successful in some cases under our observation, but we are not prepared to consider that that was the cause of the change in the condition or the reduction in the number of cases.

The overfeeding of ordinary nutriment to hogs, when nutriments are plentiful, or when the owners are trying to crowd the hogs rapidly, is the period of time when we seem to have more hog paralysis than under other conditions. Dr. Jay rather favors the idea of cutting down on excessive protein feeding, in the herds where they have this condition to a large extent. It is fortunate that not a large percentage of the hogs have this disease and the losses from it are not devastating in the general run of cases. We have, however, herds in which the losses are very serious and render absolutely impossible a continuation of the swine business under those conditions unless a change can occur.

We are not prepared to say which one of these things may be the cause of this condition, and just how to proceed to cure it or to stop the development of it. I don't think any one has had very much success in curing hogs that are affected with the disease and we, therefore, in ordinary animals, that show evidence of this disease, recommend slaughter as soon as possible in order to get their pork value from them, because there is practically no change in the meat in the early stages.

After the disease progresses, there has been another change reported and that is edema of the nerve trunks. We have not

sectioned any nerves of hogs, since we were in a position to recognize the presence of edema if it existed. We have sectioned the spinal cord and nerves of hogs infected with this disease years ago, when we did not have the ideas in regard to it that we have now, and while we did not find any definite pathological lesions at that time (not looking for conditions which we would look for today) we might have overlooked a pathological change, if it were present in the nerves, consisting of edema or other slight changes.

Dr. Schwarze has the history of these hogs. I don't know that there is anything to be brought out in it. I think everybody has seen this condition, but I would like to have Dr. Schwarze give the history anyway.

DR. SCHWARZE: There were two litters of these pigs that were farrowed the middle of January, 1922, and these pigs here are from each litter. They are not inbred animals, however, but crossbred. They first took sick about April 15th, and one that took sick has recovered and three of them never contracted the disease. There were fourteen pigs in the two litters, and ten of them developed this paralysis.

The pigs that were not affected with this condition at the present time weigh over two hundred pounds. They all have a good appetite and they seem to squeal a great deal, especially at the beginning of the attack. They were first fed corn, skimmed milk and green grass. That was when they took sick. After they developed this condition they were fed tankage, oats, corn and whole milk, without any results. That is all the history I have on the condition.

DR. HART: It is peculiar, when a veterinarian is trying to find out the feed that hogs are receiving, in herds where dietary troubles are suspected, how difficult it is to get from the owner all the feeds that he is giving the hogs. Dr. Jay makes a specialty of getting this information and any hog owner that doesn't give him all the information about what he is feeding will have very little chance of getting by with it, because he will walk all over the ranch until he finds the place where the owner is feeding something that he has not told him about. It is surprising what a large number of hog owners will pretend to think that they are not feeding their hogs nearly as much as they are. There are other cases in which the owners will be feeding their hogs a great amount of a small variety of foods.

These are two things that Dr. Jay particularly looks for, and

has been successful. I would say he has been very successful in field work in stopping the further development of these cases. Certainly he has placed us in a position that we don't have the same discouragement in going out to help owners with this trouble that we had before he came out there with us. The only thing that we know to do is to see that hogs are not overfed, and to see that they have sufficient variety, that in case it is vitamin deficiency, the variety will be great enough to get in at least the important fat-soluble A and the water-soluble B vitamins. I think that is all I have to say. (Applause).

CHAIRMAN KINGMAN: Dr. Schwarze wants to call your attention to some factor regarding this pig here.

DR. SCHWARZE: You will all observe the breathing of this animal. This animal was shipped in by express and he has developed that condition of which I was speaking to you, in those hogs that we posted. It shows very typical symptoms of that condition and if you open him you will no doubt find those lesions that are quite common.

QUESTION: How do you account for that?

DR. SCHWARZE: Just some exposure of some kind. Its vitality was lowered some way or other. It has been moved from its natural habitat, the environment has been changed, and it just simply seems to lower the resistance and has a tendency to develop that condition.

QUESTION: What is your name for that condition?

DR. SCHWARZE: I am not naming it. It is interesting and is the condition we find in hogs being shipped.

QUESTION: What is the pathological lesion of his lungs now?

DR. SCHWARZE: They may be on the same order of those you saw going there.

There is one thing: If these cases run along any length of time you will get a distinct pneumonia. It is mainly an edema now, but give them time enough to develop and you will have a pneumonia.

QUESTION: Is there any treatment for that condition?

DR. SCHWARZE: I would not know what to say. There have been a lot of treatments prescribed—bacterins, serums, etc. I am not in a position to comment on that.

QUESTION: How long would it be before pneumonia developed?

DR. SCHWARZE: Quite rapidly. In four or five days.

We are not in a position to say what the mortality is. Sometimes it is low and again it is very high. It runs anywhere up

from five percent to seventy-five percent.

DR. FERGUSON: Are there any material changes in the petechiae, or in the leg bones in that condition?

DR. SCHWARZE: In the coloring of it?

DR. FERGUSON: Is there any excess of animal matter in the make-up of the bone?

DR. SCHWARZE: You are talking about paralysis. I do not know anything about that. I have never studied it; no man knows less about paralysis than I. Dr. Hart probably could tell you more about that.

CHAIRMAN KINGMAN: We will open up the question box for just a few minutes, so you may ask Dr. Cahill or Dr. Schwarze or Dr. Joss, any of the questions that you have in mind.

DR. HASTINGS: I would like to ask Dr. Joss a question.

Do healthy hogs show cholera lesions after double treatment? If they do, how long?

DR. JOSS: I believe in vaccinated animals you might possibly find some of the petechiae in the kidney, and maybe a few in the bladder, as late as the tenth or twelfth day, following simultaneous treatment. I might answer that question a little more to the point in regard to the hyperimmune. The regulation is that they shall not be killed earlier than ten days subsequent to the date of hyperimmunization, because you will find lesions in the bladder and kidneys if you do, although those hogs have normal temperatures and they are apparently all right.

After the tenth day they will probably all disappear in normal hogs.

DR. HASTINGS: What abnormal conditions do you find?

DR. JOSS: Nothing out of the ordinary in seven-day pigs. I know that to be a fact, because in accidents, sometimes, when a pig gets killed, you will find petechiae in the bladder and the glands slightly congested, yet those pigs are apparently in a normal condition.

DR. SIMMS: Dr. Hart, I would like to ask if you have any evidence that the absence of vitamins is concerned with this paralysis we see in hogs? It seems that our observation has shown we have just as small a percentage of cases where the food contains all the vitamins necessary, as we have where the foods are short in vitamins, and I am asking this question because it seems to me that we as veterinarians are becoming quite enthusiastic in the use of vitamins, or in the diagnosing of diseases where we do not have any evidence that the lack of vitamins is ordinarily

concerned. It is a well established fact, of course, that we can produce certain diseases from lack of vitamins, but you will notice, gentlemen, that we always select in our experimental work those animals which are especially susceptible to the lack of vitamins.

We select the pigeon to produce the neuritis lesions, the rat for absence of the fat-soluble, and the guinea-pig for scurvy. Those animals are susceptible to those diseases and our domesticated animals which are ordinarily raised on our farms are not so susceptible, and experimental evidence usually points to the fact that these diseases are negative rather than positive in cattle and horses, and probably in hogs. I am saying this just because I feel that we have gone crazy on the subject of vitamins.

DR. HART: I think that the statement of Dr. Simms is very well taken. We have absolutely no evidence that vitamin deficiency alone will cause paralysis in hogs. That is the reason I have carefully used the words dietary trouble, rather than deficiency trouble, because deficiency trouble is a restricted trouble, due to lack of one of the secondary dietary essentials.

We haven't direct evidence that the other conditions are the cause of paralysis in hogs, but we have certain factors shown in regard to the development of the cells of the hogs, with the rapid increase in the animal's weight, that offers a possible opportunity for this animal to become susceptible to dietary troubles more than some of our other species of domestic animals. We are of the opinion that it may be classed as a dietary trouble, but not necessarily a deficiency trouble.

CHAIRMAN KINGMAN: Are there any other questions?

Will the horse clinic be ready at one o'clock?

DR. RIVES: Yes.

CHAIRMAN KINGMAN: You understand that the tuberculosis carcasses will be exhibited following the horse clinic, that the program has been changed in that respect, and that Dr. Merillat will appear at one o'clock, until three, and we will be guided then to Armour's to see the tuberculosis carcasses.

Dr. Eichhorn is going to tell us about this pig.

DR. EICHHORN: I have been requested to look at this hog with a view to its possibly being a case of swine erysipelas.

There is no indication whatever of erysipelas. We found that the cutaneous lesions were typical hemorrhages and on post-mortem examination we found a very interesting condition in this hog. It is rather unusual, I would say. If you examine the

lungs you will find there a multiple abscess formation with distinct pus formation. These lesions have probably existed for a considerable length of time. In addition to these abscess formations you will also note, at the apex of both lungs, an acute pneumonic condition, with gelatinous and even interstitial infiltrations, which indicates an acute condition of this part of the lung involvement.

You will notice the same acute condition on the heart, in the form of diffused hemorrhages, and also in some parts you may note petechial hemorrhages.

The acute infection is further demonstrated by the petechiae in the bladder, and also by the distinct circumscribed petechiae on the surface of the kidneys.

While this hog has evidently chronic infection in the lungs, which is manifested in the form of the multiple abscess formation, this condition, however, has no direct bearing whatsoever on the acute infection. Only inasmuch as the chronic lung lesions have probably devitalized the animal, it thereby becomes readily susceptible to the acute infection to which it might have been exposed. The acute lesions are very typical of hog cholera and I would consider that the death of the animal was due to such an infection. The multiple abscess formation has apparently no association with the cholera lesions and has probably existed for several weeks, before the acute disease of cholera developed.

DR. NEWSOM: What is the general thing to offer on the causation of that trouble?

DR. EICHORN: The development of the multiple abscess in the lungs, and also in some of the lymph glands, was probably due to a pre-existing infection with some of the pyogenic organisms. They do not appear to be the result of hemorrhagic septicemia for the reason that the pneumonic conditions are not typical of the infection in the lung tissue caused by the hemorrhagic septicemia organisms.

DR. CAHILL: It seems to me that this is the best summary of the hog clinic this morning that one could possibly get. We have talked on necrotic enteritis and hemorrhagic septicemia, and in this pig we have all the lesions that have been described for either disease. If I am correctly informed on the history of this case, this is a pig that has been vaccinated. This trouble has followed as an acute infection, as a result of superimposing hog cholera virus on an already existing disease, and if that is true, we have in front of us now, a typical picture of the cases

which are responsible for so much grief among veterinarians—the post-vaccination trouble which is so common.

You have the lung there that is sufficiently chronic to indicate that it was not healthy at the time the virus was given. You have a chronic infection that has been there for weeks, and we have the acute infection that Dr. Eichhorn speaks of as superimposed on that. After my talk on necrotic enteritis somebody asked if I would advise that a pig affected with that condition be given a simultaneous treatment. If you do, this is just exactly what you get. The difficulty is to recognize these conditions which are present in swine, and which fail to show sufficient symptoms for the practitioner to recognize at the time he administers the hog cholera virus. I believe that this is the very condition which is responsible for ninety percent of the post-vaccination troubles.

QUESTION: What temperature would be used as a guide, whether or not to give simultaneous treatment?

DR. CAHILL: You could not go by temperature alone. In chronic enteritis you will catch lots of pigs that have very slight indications of diarrhea, without a marked elevation of temperature. It is easy enough to pick out these marked cases of chronic enteritis, but it is difficult to pick these cases where the animals are not showing symptoms, yet harbor chronic pulmonary or intestinal lesions, and should not be vaccinated.

DR. FERGUSON: For example, we have a bunch of hogs in practice that have that condition, or that are in the incipient stage of that condition. Wouldn't it be possible, by stirring them up right sharply, to get a decided coughing from the cases of that kind?

DR. CAHILL: You generally do. If you rush into the herd and vaccinate, and rush away again, this is what generally follows:

QUESTION: May I ask why, if you sometimes revaccinate with serum, that almost invariably you get good results?

DR. CAHILL: I think you are a little strong when you say invariably. You frequently do. •You will frequently get good results if you give any immune serum, or even normal hog blood.

DR. SIMMS: If you give the serum and virus, almost invariably, in my experience, it stops right there.

QUESTION: How do you judge the age of the lesions?

DR. CAHILL: I don't think you can judge it.

DR. EICHHORN: If you examine the lungs closely, especially

the abscess and the surrounding tissues, you will find that it takes at least two weeks for the lesions to develop into a stage as seen in the specimen. It is, of course, difficult to judge accurately the age of lesions of this kind, nevertheless we can safely state that the lesions are older than one week, whereas the acute condition is of more recent development.

CHAIRMAN KINGMAN: We thank you for your interest, gentlemen. Remember we will begin again at one o'clock.

The meeting adjourned at eleven forty-five a. m.

ADJOURNMENT

LARGE ANIMAL CLINIC

THURSDAY AFTERNOON, AUGUST 31, 1922

The meeting convened at one o'clock, Dr. Kingman presiding.

CHAIRMAN KINGMAN: I am going to turn the meeting over to Dr. Merillat.

DR. MERILLAT: I think it was in 1890, at Atlantic City, that Dr. C. B. Michener brought a cow into the clinic of the Association for the first time. It was thought quite an innovation for the A. V. M. A. to have a cow clinic. I rather believe if it hadn't been for the respect the audience had for the doctor's ability, he would have been laughed out of the place.

The situation has so changed that the clinics of associations are now often as horseless as they were then cowless, but this is not as it should be. The horse is too important a creature to be eliminated from the affairs of man, and unless an awakening occurs, the disregard for the horse will revert very materially, against the progress of society. I think I have mentioned before that nations that ignore the horse have either perished from the earth or else have taken their place among the second-rate nations, while those that have made the best use of horses are today the powerful, strong nations of the earth.

Today the United States is in a transition period in this particular connection. Replacement of the horse by costly machinery might make us a third-rate nation, for the reason that no nation can spend more than it earns with impunity. In the case of individuals, the result is bankruptcy; in the case of nations, it means decadence and probably disintegration.

There is just a certain amount of wealth dug out of the earth every year; we mine our product from the earth, and if we waste more than we mine, and continue to do so, the result will be

decline. That is probably what is happening today; it is very likely that we are not mining out of the land of the United States as much wealth as we are wasting in motor vehicles. The billions of dollars that are made into beautiful vehicles and automotive tractors of different kinds, only to deteriorate and rust in a few years, is a waste that makes the waste of war seem insignificant; and unless we produce more cheaply, the wealth we now enjoy will be dissipated. So when I speak for the horse, I am not speaking for a species of brutes, but for society; because it is the cheapest, the most economical, the most sane motive power that ever has been maintained by man. In spite of inventive genius, there is yet to be found a motor power that will produce as much for the investment as the horse. So it is not only the veterinarian who is interested in promoting the welfare of the horse, but every man, woman, and child in the country.

The horse is a very old, domestic animal. Two hundred and fifty thousand years ago the horse was already undergoing domestication, and already played a very important role in the affairs of man during the days preceding the beginning of history. You all know what he has done for mankind since.

Our first case here is a lame horse which I wish Dr. DeVine would examine. This is a trotting-bred mare, six years old, with a record of about 2:20. She went lame last year during the racing season, and again broke down and was unable to finish this season.

The next case is a seven-year old mule with cataracts; one eye with pretty complete opacity and one just beginning to cloud up; probably there are some adhesions in the case of the left eye, and, of course, being a market mule, there is no history coming with it.

It is quite natural to diagnose a case of this kind as periodic ophthalmia, a disease that is very common in certain districts of this country. It is relatively rare in Europe. It doesn't exist very much west of the Rocky Mountains. There are regions in the middle West where the disease is very prevalent, and others where it is not known, but the toll it takes from the horse industry as a whole is enormous, there being some districts where horses cannot be raised profitably on account of the large number of three-, four- and five-year old horses that become blind before they can be put on the market.

There have been many investigations made as to the cause of this disease. It has been thought to be the result of bacterial

infection, but in spite of investigations, both in this country and in Europe, no causative bacterium has yet been found. Those who have studied the disease most, are beginning to believe that it is not a bacterial disease. I would like to have reports from the districts of this country where the disease is most prevalent.

Dr. Cameron, is periodic ophthalmia a common disease in the Northwest?

DR. A. E. CAMERON: In the Northwest there are very, very few cases. I don't remember having seen one, personally. In Eastern Canada and Ontario, I understand there are quite a few.

DR. S. E. HERSHEY (Charleston, W. Va.): We have a great deal of it through West Virginia, and especially the northern section, in the Patterson Creek Valley. We got some Percheron horses there, about twenty-five or thirty years ago, and since that time I am safe in saying that sixty-five percent of the draft horses raised in that section have periodic ophthalmia. In the southern part of the state we have very little, possibly not more than ten percent.

DR. W. H. WELCH (Lexington, Ill.): We have lots of it in central Illinois. I couldn't say as to what percentage.

DR. MERILLAT: Is it a disease met with in practice constantly in Illinois?

DR. WELCH: Yes.

DR. MERILLAT: Is there any one here from west of the Rocky Mountains?

DR. E. E. WEGNER (Pullman, Wash.): The disease is not known in the state of Washington.

DR. MERILLAT: How about Chicago, Dr. Quitman?

DR. E. L. QUITMAN: We have lots of it, but it is sent to us from the country.

DR. MERILLAT: How about the horses that have been in Chicago a while?

DR. QUITMAN: It does not develop in horses that have been in Chicago over a year, and I would say ordinarily over six months; sometimes the onset of it seems to be delayed for perhaps six months, but even in that length of time it is rare.

I am a firm believer in the fact that all of our cases of periodic ophthalmia in Chicago,—and we have lots and lots of it,—are cases which have had a primary attack in the country, and the veterinarian in the country advised this client to send his horses to the city and cash in.

DR. MERILLAT: Not the Illinois veterinarian. (Laughter).

DR. QUITMAN: We feel assured that the disease is not transmissible from one animal to another, because we have many cases of a new horse showing it and intermingling with other horses, and it never affects any of the other horses that have been there over six months or a year.

DR. T. H. FERGUSON (Lake Geneva, Wis.): We have lots of periodic ophthalmia in Wisconsin, and it is usually seen quite extensively after outbreaks of influenza; it seems to be a sequel to influenza in young horses. Occasionally we have a case in an old horse; we get quite a few cases shipped to us from Chicago. (Laughter). The wise birds send down to Chicago to get some nice horses pretty cheap, and a good many times they draw a "moon-eyed" horse; they don't notice it until they get home. Maybe I notice it before they do, if they happen to bring them around. We get a good many cases.

DR. D. H. UDALL (Ithaca, N. Y.): We get plenty of it in New York. There is always plenty of it in Ohio. I am under the impression that there is much more in Ohio than there is with us.

DR. C. P. FITCH (St. Paul, Minn.): We have it in Minnesota. I don't think it is as common as it is in New York, but we do have it, and enough of it. I don't think it is as common as I saw it in the East.

DR. HAMLET MOORE (New Orleans, La.): We have quite a little of it in the South, but I was always under the impression, and am yet, that it is hereditary.

I practiced in Kentucky a short time and there was the Squirrel family of saddle horses. I know it ran through them to a great extent. There were several families of Squirrels there called the Red Squirrels. I don't remember the original sire, but after those saddle horses got to be four or five years old, there were a great many of them that developed periodic ophthalmia, and I was always under the impression that it was a strictly hereditary disease.

DR. MERILLAT: Has any one an opinion as to the cause of periodic ophthalmia? Has any research work been done in New York?

DR. UDALL: No.

DR. MERILLAT: Has anybody else any theory to advance as to the cause?

DR. A. G. STANFORD (Clay City, Ill.): I live a hundred miles

east of here and it seems as though it affects only the Clydesdale horses in that part of the country, and, in fact, they have almost quit raising the Clydesdale on account of that. Why is it that it affects them more than any others?

DR. WELCH: About five years ago, I think, Dr. Merillat and I had an argument over this on our way home from the Peoria convention. When we got through, he wound up by saying, "Welch, if I thought so, I wouldn't even say so in the presence of a veterinarian." At that time I made the statement that I believed that periodic ophthalmia was a sequel of influenza and distemper, that we saw it on special farms in the country where, through the early spring months, we had an outbreak of influenza and later a number of eyes would be lost on that place.

DR. QUITMAN: I would like to ask Dr. Welch to account for the fact that in Chicago we have thousands and thousands of cases of influenza, but as I said before, there are certain horses that do not become afflicted with periodic ophthalmia. Don't you think you have a local condition there that induces it, and influenza and distemper cases perhaps are left in a condition whereby they contract the disease more readily?

DR. WELCH: I think that the majority of influenza is much more severe among the younger growing animals, that the power of resistance of the more aged is stronger, and that is the reason you don't get so much of it in the cities. Your horses are aged and their vitality is better.

DR. QUITMAN: There would be some exceptions to the rule, but you never get it in a horse that has been in the city six months.

DR. WELCH: But where you have one case you have another following usually.

DR. QUITMAN: No, sir, we don't.

DR. MERILLAT: Dr. Bell wants to say a word.

DR. W. M. BELL (Nashville, Tenn.): We have lots of it in Tennessee, and it is not shipped in there from anywhere. The horses are raised there, and there is no breed that is exempt.

At the time the Bell-Meade Farm sold out, they had forty blind brood mares. We had a number of thoroughbred farms at that time and they all had quite a number of blind brood mares. Some of these brood mares were some of the best mares on the farm, and their colts brought the highest prices. Now we have also had it among the standard-breds; we had a number and have still a number of standard-bred farms that breed standard-bred horses and they have lots of it, and we also have it among

the mules; a great many mules have it that are raised in Tennessee. We also have it among the Percheron horses that are shipped in there and used there, and we also have it among the Shetland ponies. Now there is no breed that is exempt, and there is no breed in which it is more prevalent than any other breed, unless that breed is more prevalent than the other. It is raised there.

I practiced in Colorado for thirty years and they didn't have any of it there. When I located in Tennessee, I got some letters some time later, from Colorado, about standard-bred trotting horses, some about thoroughbred horses; they wanted a stallion and they didn't care if he was blind. They had used enough blind stallions in Colorado and they felt no fear whatever in using a stallion of that kind. For a horse to turn on the range, they wanted a horse that could see, but for the horses they kept up, they had no fear of periodic ophthalmia.

Now it looks to me like the climate has something to do with it. In that high, dry country where they have no malaria, there is no periodic ophthalmia, although they sometimes have influenza. Where we have lots of malaria, we have plenty of periodic ophthalmia.

In the city of Nashville, horses that have been working on the streets, in transfers, for a number of years, very seldom become victims. Our city is not as large as Chicago, but at the same time these horses get out at grass very little; they are kept up and worked steadily on the street and after they have worked a year on the street they very seldom develop this disease.

DR. MERILLAT: The probability is that breeding stallions that are taken into districts where this disease is prevalent get a very bad name, by reason of their colts becoming affected.

In Illinois we are studying the effect of the feed on the eyes of horses.

Dr. DeVine will now tell us what is the matter with this horse.

DR. DEVINE: As you sit there you see this horse is lame in both feet, but the history indicates that her left leg is giving her the most trouble. She has been lame about three months. There is a little periostitis near the carpus, almost involving the joint, and the tendon and sheath are involved. That evidently has not been very severe, because she has little lameness now. She is unbalanced now; she is standing crooked. If her feet are not given special care, it is a question whether or not she will ever amount to anything as a race mare. It would seem reason-

able to relieve the inflammation of that tendon, and then treat it as you like. The average man would fire it, but I would not fire it if it were my case. I would take the soreness out and reduce the tendon during the winter. Give special attention to her feet and get some of the acute inflammation out.

DR. MERILLAT: The next case is one of chronic laminitis.

I want to introduce Dr. G. A. Roberts, formerly of the United States, now of Brazil, who will demonstrate the new operation for this condition.

DR. G. A. ROBERTS: If I may borrow just a minute, gentlemen, I would like to boost Brazil. Any of you who anticipate a vacation trip this fall or winter, and care to go down below the equator, where the seasons are changed and where you have to look north to see the sun, you will find a most interesting view. At the present time an exceptional opportunity is offered because the dollar goes so far in that country. Their money happens to be very cheap and the dollar happens to be very high, so you can go a long ways in Brazil, at the present time, with exchange at the present rate. The city of Rio you will find to be one of the most beautiful ports in the world; many who have traveled say they have never seen a more beautiful port than that of Rio, and from there on back through the coffee country, in the state of Sao Paulo, where the world's coffee supply is grown, you will find many, many things to interest you, if any of you care to have such an experience. I would like, in introducing the subject, to make just a little alteration in the title. It is down on the program as "Operative Treatment for Laminitis." I would like to put it, "Dr. Stranaurd's Operation for Laminitis. Many of you have read Dr. Merillat's comment on this operation. I would like to say that I have two reasons for presenting this subject; one is because of the radical change of view as to the theory of laminitis, or founder, by Dr. Stranaurd, and the second reason is that Dr. Stranaurd and myself were colleagues for the past two years in Brazil.

Dr. Merillat made this comment, some time ago, on this treatment of Dr. Stranaurd: "His conception of laminitis is a great contradiction of all previous and well-established inter-relations of all old and modern authorities. Laminitis, according to Stranaurd, is not an inflammation at all, and we believe he is right, for, after all, when we come to think of it, there is not a single feature of the local phenomena that simulates an inflammatory process except possibly the heat. The structural altera-

tions and terminations are not those of an inflammation of the cartilaginous membrane, as would be the case if the disease process were in reality a laminitis."

Dr. Stranaurd is a Belgian veterinarian, and was in the Belgian Army during the war; he had the opportunity of working a great deal with what we are inclined to call laminitis, or what he prefers to call founder, not calling it an inflammation, although I am not so certain that he wouldn't say there might be some inflammatory conditions present. But the inflammatory condition, if present, is a very limited factor. The greater factor is that of an upsetting of the vasculo-motor apparatus, in which, because of this, the vessels become dilated to the extent that circulation is impeded in the foot and to that extent then changes take place very rapidly, such as to bring about the conditions that we observe in laminitis.

Dr. Merillat, in his article, treats more or less on the acute form of laminitis or founder, and what I have to say is not with reference to the acute form, because in the acute form Dr. Stranaurd likewise uses the same method as we do to a large extent. On the other hand, he does stress very strongly the moving of the animal in order to prevent this condition in the first place, or in the very early stages of founder, to keep the animal moving, so as to assist in the circulation of the blood through the foot before these permanent conditions take place.

Dr. Stranaurd likewise had some most interesting specimens of pedal bones, in which he was able to indicate very materially the absorption process of the disease, due to the impeded circulation in the foot. In long continuous cases of laminitis, he showed where there had been an absorption of nearly half of the anterior part of the pedal bone, due to the absorption process.

To get down to the point of his operation, I would like to say that we are unable to operate here because of inadequate instruments, so we attempted to get a foot and do the best we could on what we have here, in order to show the method of his operation for those cases that do not respond to the ordinary lines of treatment in the beginning, such as that of the keeping of the animal in motion, that of the foot bath, that of the use of depressants, either of local blood-letting, to a certain extent, or of the use of the medicinal depressants, such as aconite, but in those cases that fail to respond in something like three weeks, and there is no sign of improvement, he does recommend his operation as most efficient, and in a very large number of cases, if taken

before too much structural change has taken place, a complete recovery has resulted. Even in very chronic cases he advocates it as the most successful and the most useful of any treatment that can be done for the animal, and he says you will be surprised, in a great many instances, at the benefit that will be derived, even in those very old chronic cases.

His theory is that the trouble is due to a disturbance of the circulation in the foot, resulting in a permanent dilatation of the blood-vessels. His treatment is the removal of those blood-vessels and letting nature reproduce a new set of blood-vessels in the part. For that reason, then, he operates on the horse standing up; he first takes one foot and uses local anesthetics, because in this case the animal is often in so much pain that it doesn't care to stand, and, therefore, in order for the animal to stand on one foot while he is starting his operation on the other, he cocainizes the foot that he wants the animal to stand on, then he lifts the other foot up and begins his operation, which is, to a large extent, a horse-shoer's job, so to speak, in that he trims down the wall of the heel, and of the side of the frog, with the rasp, so as to get complete relief of any pressure over the region of the heel and of the inside of the frog. Before getting to the sensitive structures here, he releases that foot and cocainizes it. Then after the effect of the cocain has taken place, he starts on the opposite foot and goes through the complete operation on the other foot, on both sides. I have taken only one side here in order to have one side for comparison. Unfortunately, with the instruments we had at hand, we were unable to do as neat a job as we would like to have done.

After exposing the sensitive structures of the latter part of the wall and the heel and the sensitive part of the frog he exposes the blood-vessels along the coronet, and of the postero-lateral part of the frog. After that, in order to remove all blood-vessels supplying blood to that region, he goes right over the exposed parts with a curet, completely destroying all blood-vessels present, carrying the curet around behind and down to the lateral surface of the sensitive frog. The foot is then bandaged up and the animal is allowed to have the freedom of a box stall for a few days, and he says in a week or ten days he is able to put the animal to light work. He says that the results from this operation are well worth the attempt to get results when everything else fails. He says he does receive favorable results in a large percent of the chronic cases where you wouldn't expect results to be obtained.

I have attempted to give only his views as to the theory of it and as to the method he uses in operation. Now there are other possible improvements that can be made; he doesn't pretend to have the operation perfected, and yet those are the principles with which he believes success can be obtained in treating these semi-chronic and chronic cases of laminitis.

Dr. Merillat called my attention to overlooking some of the other ideas of Dr. Stranaurd. He illustrates by a chart, showing that where there is a principal channel of blood supply coming down to the foot, passing down through this central channel, there is a more rapid rate than normally and the lateral vessels failed to get their due supply of blood in them, with the result, then, that there is a very unequal distribution of the blood in the different vessels that go to the foot, because of the main supply getting such an excessive current of blood through it to the point that it finally breaks down, losing its vascular nervous control and resulting in a permanent dilatation and a somewhat limited supply of blood going through the other vessels.

DR. MERILLAT: The thing we ought to remember about laminitis is that the old notion of keeping horses quiet is wrong, and that there is a treatment available for subacute and chronic cases. So far, in this country, we haven't operated on enough chronic laminitis cases to confirm what our Belgian colleague has said. Horses have been rather cheap and there isn't very much inclination on the part of the owners to keep them through the period of convalescence, but let us remember there is a classical surgical operation for chronic laminitis that has value.

CHAIRMAN KINGMAN: I want to get straight on this laminitis. Does Dr. Roberts admit that there is such a thing as rotation of the pedal bone upon the transverse axis in its relation to the hoof?

DR. ROBERTS: I am not convinced of it myself, Doctor, although I am willing to be; I am from Missouri, originally.

I asked that question of Dr. Stranaurd. He doesn't say it is always a rotation, but he says the only cases in which he has not received benefit from this operation are when there is a sufficient deflection of the bones remaining there for such a length of time that they have become fixed.

CHAIRMAN KINGMAN: I am maintaining that there is actually a rotation of the os pedis in its relation to the bones of the leg, but that apparent rotation with relation to the hoof is perhaps a misnomer, and is due to the slipping of the hoof upon the os

pedis rather than a rotation. The point I wish to bring out, if that is true, is what is it that permits this rotation of the hoof, then, upon the os pedis, or the rotation of the os pedis, just as you choose to call it?

DR. ROBERTS: There is often a very perceptible excess of serous fluid in the foot that allows considerable rotation to take place. In this connection it may be greater at one point than at another point, and therefore, you get a rotation at one point that wouldn't be given at another.

DR. MERILLAT: We plan to use the next subject to demonstrate dental nerve-blocking. The procedure consists of the injection of an anesthetic solution in the dental canals. By inserting a needle through the infraorbital foramen, a large volume of fluid is driven back into the canal.

Dr. Bemis, you will remember, performed nerve-blocking by delivering the fluid on the nerves of the posterior end of the dental canal, and was particularly successful, insofar as the upper jaw is concerned, the objective being to deliver fluid at the maxillary hiatus with a needle five inches long.

DR. BEMIS: I will just take a moment to recall the anatomy, so you will realize it fully, if you have not recently looked over a horse's skull, or tried this injection.

Of course, you realize that immediately below this region is the large temporal fossa, and if you remember from your anatomy, the nerves pass across the floor of this fossa, coming from the cranial cavity and the supermaxillary nerve, which gives off the branches of the superior dental nerve, and finally supplies all of the superior cheek teeth in that particular arcade and goes down to the depth of the maxillary hiatus.

Now, by merely observing on the skull where a needle should pass in order to reach that nerve, we developed this method to reach the dental nerve. The maxilla is curved slightly backward posteriorly. In passing a needle, if it is found to come in contact with a bone, after it has passed to a depth of possibly an inch or two inches, one will know that the needle is slightly too far anteriorly. Then all that is necessary to do is to withdraw the needle part way back through the skin, but not from the skin, and redirect it slightly backward. Attempt to follow as closely as possible the outline of the maxilla in the depth of the fossa, because it is at the very anterior part of the fossa that we wish to make the delivery. Then, passing the needle again, it will be found to penetrate to a depth of possibly three or four inches,

depending upon the size of the animal. At that point a reaction on the part of the animal will sometimes be noticed on account of hitting the nerve directly. We then inject about four cubic centimeters of a two-and-one-half percent solution of a local anesthetic, either cocain or novocain, or any of those drugs which are giving good results. In my own work I discontinued the use of cocain altogether, because I think there are other drugs which are less toxic and give just as good results.

Now for the interior dental nerve the results are not quite so satisfactory, because the inferior dental nerve is much harder to reach.

DR. FERGUSON: How long a needle do you have to use?

DR. BEMIS: About a five-inch needle.

DR. MERILLAT: I have used Dr. Bemis' method from the very day we heard of it, and have had very splendid success. I believe the reason that it has not been used as a routine measure is because it was thought difficult and dangerous, which is not the case.

DR. WEGNER: How much fluid do you use?

DR. MERILLAT: Generally about four to eight cubic centimeters.

Now I want to draw your attention to a system of throwing horses.

DR. QUITMAN: Demonstrate how you lift a horse up.

DR. MERILLAT: That is done by centering the rope around the neck, cross it in between the front legs and again cross it over the back, then between the hind legs and up the middle of the back under the crossed ropes and tie to the front rope passing around the neck.

DR. CLARK: I have another way. I take four automobile casings and put one over each leg, and bring the two front ones together and the two back ones together at the top, then fasten a single-tree to them and pull him up. The single-tree runs lengthwise across the back.

DR. MERILLAT: I didn't make any attempt to demonstrate this simple method of casting horses in our other operation of nerve-blocking. We just wanted to show this pony that we would block his cheek teeth if we wanted to.

I have been requested by a number of veterinarians here to demonstrate this simple single-rope method of casting horses. I had used other methods for many years, until about five years ago, when the veterinarians in Saskatchewan showed me this

method, and since that time I have never thought of any other way. It is perfect in regard to securing horses so that they will not hurt themselves. It is a method of restraint that actually immobilizes the body, and all I request of prospective critics is to suspend judgment until they have tried it several times. The method looks simple and it seems to be nothing new. But it is quite new in many respect if every part of the system is carried out according to certain prescribed directions.

The rope must be one-half inch in diameter. If you think of using a rope larger or smaller, then don't try this method. Any kind of a cheap rope will do, but its dimension must be one-half inch. About sixty-five feet is required for an ordinary horse. If a large, ton horse is to be handled, it is necessary to use seventy-five feet. This rope is over eighty feet long. It is advisable for a country practitioner to use two forty-foot lengths. One forty-foot length is long enough to cast any kind of a small animal, whereas if a large animal is to be cast, then the two are used together.

Any kind of a bowline knot will do. Another thing I would make clear is that, if you don't use such a knot, then don't use the rope or contemplate its use, because a common knot will tighten and be almost impossible to untie.

(Method of casting was demonstrated)

QUESTION: Wouldn't you prefer a cotton rope?

DR. MERILLAT: Yes, I believe white, cotton ropes are a little better, in fact, preferable to these if double half-hitches on the leg are not used, as it is difficult to loosen them. A double half-hitch, once tightened on a leg, sometimes makes a knot that can't possibly be opened; otherwise, a cotton rope is very good, if the half-inch size is used.

DR. BELL: We use a method similar to this. We tie a foot up, pull his head to the side, and he lies down.

DR. MERILLAT: I don't object to that, but I am quite sure if you will just stick to this simple system, you will seldom have an accident.

If you operate on the inguinal region, the knot on the back is set a little further back. The knot on the back is set almost at the croup.

CHAIRMAN KINGMAN: Is Dr. Reed here? Dr. Reed has an announcement to make.

DR. REED: Owing to the fact that Prof. H. R. Smith cannot be here tomorrow morning, it has been decided that it would be

best to allow him to read his paper on "Tuberculosis in its Relation to the Feeding and Marketing of Live Stock," this afternoon. It fits in particularly well with the demonstration that will be given in a very few minutes after Prof. Smith has read his paper. I will ask Prof. Smith to read his paper at this time.

(Prof. Smith read his paper, which was published in the JOURNAL, January, 1923).

ADJOURNMENT

(To be concluded)

We Want 5000 Members This Year.

COLORADO ENDURANCE RIDE—1923

The 1923 Colorado Endurance Ride will take place at Colorado Springs, Colo., July 29-August 4. These Endurance Rides are approved by the War Department, the Chief of the Remount Service, the Chief of the Bureau of Animal Industry of the Department of Agriculture and the Sponsors. The latter include several private individuals interested in good horses, the American Remount Association, the Arabian Horse Club of America, the Genesee Valley Breeders' Association, of Avon, N. Y., the Horse Association of America and the Morgan Horse Club.

The Endurance Rides are designed to stimulate general interest in the breeding and use of good saddle horses of a general utility type, possessed of stamina and hardiness and at the same time having the necessary quality to render them suitable for use in the mounted service of the United States. In particular, it is desired:

(a) To demonstrate the value of type, soundness, and proper breeding in the selection of horses for long and arduous work under the saddle.

(b) To ascertain and to demonstrate the proper method of training and conditioning horses for long and severe work under the saddle.

(c) To encourage horsemanship in long distance rides.

(d) To ascertain and to demonstrate the best methods of caring for horses during and after long, severe work, without artificial aids or stimulants.

Drs. M. J. Dunleavy and A. J. Savage, of Colorado Springs, Colo., are the official veterinarians.

OTHER MEETINGS

NORTH CENTRAL IOWA VETERINARY MEDICAL ASSOCIATION

The regular spring meeting of the North Central Iowa Veterinary Medical Association was held at Fort Dodge, Iowa, May 28, 1923. Previous spring meetings have not usually been so well attended as was the case this year. The splendid program, however, called out practically the entire membership.

The retiring President, Dr. J. H. Lynch, Fondä, Iowa, in an address on some of the matters of interest to the profession, called attention to the work done by the Association during the past year.

Dr. C. P. Fitch, of the University of Minnesota, gave a splendid lecture on Abortion Disease in which he made a resumé of the recent research work done on this disease and offered many practical suggestions for controlling bovine abortion.

We were also fortunate in having on the program Dr. H. Preston Hoskins, of Detroit, Michigan, Editor of the Journal and Secretary of the A. V. M. A., who told something of the work of the new position of Secretary-Editor and showed by his statements that it is essential that every veterinarian eligible to do so should join the National Association and read the Journal. Dr. Hoskins made it plain that there is a place in the Association for every veterinarian throughout the country and his visit to this part of the State will do much good, as it has brought nearer to the profession the desires and aims of the National Association.

The addresses above referred to were followed by an interesting paper on Hemorrhagic Septicemia, by Dr. W. P. Bossenberger, of Williams, Iowa, and a most instructive paper by Dr. F. H. Kelley, of Goldfield, Iowa, on the handling of riding and driving horses. Dr. Kelley's paper was timely and brought out some new and practical ideas for veterinarians to consider.

The following officers were elected for the ensuing year:—President, Dr. C. W. Anderson, of Jewell, Iowa; Vice-President, Dr. E. R. Truax, of Sac City, Iowa; Secretary-Treasurer, Dr. H. J. Shore, of Fort Dodge, Iowa. Dr. W. F. Miller, of Storm Lake, Iowa, and Dr. C. E. Juhl, of Osage, Iowa, were elected to fill vacancies on the Executive Board.

In the evening the members, their wives and friends were entertained by the Fort Dodge Serum Company at a dinner and dance.

H. J. SHORE, *Secretary*.

We Want 5000 Members This Year.

B. A. I. VETERINARY INSPECTORS' ASSOCIATION OF CHICAGO

The following is a report of the meetings held during the last month by the school of instructions for veterinary inspectors, which meets in the Government office of one of the local plants each Monday morning. The Chicago Branch of the National Association of Bureau of Animal Industry Veterinarians prepares a program for several weeks in advance on various subjects relating to meat inspection. Pathological specimens of interest, as well as rare conditions found by the inspectors are collected during the week and presented to the meetings for diagnosis and discussions.

May 14, 1923. The third talk on the "Lymphatic System and Its Importance to Post-Mortem Inspection" was given by Dr. L. T. Hopkins, and illustrated on large charts showing the afferent and efferent vessels.

May 21, 1923. The collection of pathological specimens was so large on this date that no regular paper was presented.

May 28, 1923. Dr. L. E. Day, who has just recently returned from Central America, where he had spent a few weeks looking for foot-and-mouth disease, was the speaker of the morning and he gave a very interesting report of his trip.

June 4, 1923. Dr. J. Hannon read a paper on Alcohol.

L. T. HOPKINS, *Secretary*

Plan To Go To Montreal, August 27-31.

ARKANSAS VETERINARY ASSOCIATION

The annual meeting of the Arkansas Veterinary Association convened at the Marion Hotel, Little Rock, Ark., June 9, 1923. President Kittrell, of Augusta, presided.

A short business session was held, the minutes of the previous meeting being read and approved, as well as the financial state-

ment of the Secretary-Treasurer. An election of officers resulted as follows: President, Dr. I. Peters, of Fordyce; Vice-President, Dr. O. D. Campbell, of Warren; Secretary-Treasurer, Dr. J. H. Bux, of Little Rock. The date for the 1924 annual meeting was set for the third Saturday in June.

The first paper on the program was by Dr. I. Peters, entitled, "Paraplegia and Other Kindred Conditions of Cattle." The author described several disorders met in cattle, that had somewhat puzzled him. These were of a paralytic nature, occurring both before and after parturition. Large doses of nux vomica and laxatives seemed to give best results, but this treatment was not always satisfactory. There were no abortions with these attacks. Inflation of the udder seemed to be helpful, although Dr. Peters was of the opinion that the trouble was not milk fever. Various suggestions were made, as to possible causes, including lack of the proper mineral requirements and cottonseed poisoning, but these seemed to have been eliminated as causes.

Dr. H. W. Wilson, of Helena, gave a chalk-talk on "Types of Special Shoes for Pathological Conditions and Faulty Conformation." He proved himself to be an expert, both as an artist and as a foot-surgeon. Dr. Wilson has given a great deal of time to the study and treatment of lameness, and he amply demonstrated his willingness to pass along the results of his practice and observation to his fellow-practitioners.

Dr. H. Preston Hoskins, Secretary-Editor of the American Veterinary Medical Association, brought a message from the national organization. He related the history of the efforts which had been put forth to secure a full-time officer, who could devote all of his time to the work of the Association and the welfare of its members. He told of some of the things which the Association hopes to be able to do in the near future. Dr. Hoskins spoke of the need and advantage of a large national organization, and explained that a larger field of usefulness could come about only through a larger membership. He explained the functions of the official Journal, and asked all practitioners to feel that they had an obligation to the Journal, and that they should hold up their end with the laboratory men, the Bureau men, and the various other branches of the profession.

Dr. O. M. Norton, of Greenville, Miss., presented the subject of "Black Tongue in Dogs." He described this disease, which has given Southern veterinarians so much trouble, and then outlined the plan under which a new treatment for the disease is

being used, with apparent success by many veterinarians in the Southern States.

Dr. Hubert Shull, of Texarkana, spoke on "Canine Practice." He explained the methods by which he had been able to build up a very lucrative, small-animal practice in his city. Many of his suggestions could be carried out by any veterinarian who desires to cater to this class of work, and thereby keep clients from going to the drug-store to purchase proprietary dog remedies.

After luncheon the members were driven out in the country, to one of the State farms, where a clinic had been arranged. Dr. L. B. Ernest, Bureau of Animal Industry, Washington, D. C., gave a practical demonstration of the technique to be employed in the intradermic and ophthalmic tuberculin tests. He also explained many of the B. A. I. regulations in relation to tuberculin testing and interstate shipments.

Dr. S. J. Shilling, Associate Veterinarian, Agricultural Experiment Station, Fayetteville, demonstrated methods of examining the female genitalia for the treatment of sterility and other sequelae of infectious abortion. He used pathological specimens and live animals in his demonstrations.

J. H. Bux, *Secretary-Treasurer.*

Have You Secured One New Member This Year?

COLORADO VETERINARY MEDICAL ASSOCIATION

A very successful three-day session, constituting the semi-annual meeting of the Colorado Veterinary Medical Association, was held at the Colorado Agricultural College, at Fort Collins, Thursday, Friday and Saturday, May 31st, June 1st and 2nd, 1923.

New members were elected as follows: Drs. Paul E. Taussig, William Earl Williams, E. S. Thomas, Albert B. Eschanbacher and Ronald M. Gow.

Under the heading of "Bulbar Paralysis in Cattle," Dr. George H. Glover discussed the paralytic conditions which we find in these animals and which are frequently discussed under the name of forage poisoning.

The subject of "Urinary Calculi in Sheep" was discussed by Dr. Harry P. Scott, of Brush, in which he detailed an outbreak of this condition in a band of lambs on feed. There was a loss of something like 50 head out of 4000. Nothing very definite could

be shown as to the causative factor but suspicion pointed to a rather heavy feeding of linseed meal. All lambs affected were males and all died as a result of rupture of the bladder.

Dr. H. F. Lienhardt, Pathologist of the Kansas State Agricultural College, was a special guest of the Association and presented papers on "Posterior Paralysis in Pigs" and "Losses in Cattle on Stalk Fields." Dr. Lienhardt illustrated his lecture on the pig trouble with slides detailing experiments which he had carried out which seemed to prove conclusively that the trouble was due to a deficiency in the diet and could be rather easily controlled by proper rationing. In his talk on corn stalk disease he pointed out that there is a malady which is entirely distinct from hemorrhagic septicemia, anthrax and potassium nitrate poisoning. He had not, of course, determined the exact cause, but for the sake of further research suggested the possibilities of an anaphylactic disturbance.

Coccidiosis in calves was treated by Dr. A. G. Wadleigh, of Monte Vista, who reported some outbreaks which had occurred in his practice. A number of interesting case reports were made by Drs. W. G. Blake, F. R. Smythe, F. F. Mendenhall, D. C. Patterson, James Farquharson and Geo. W. Dickey. The latter presented four goats which showed all the paralytic symptoms commonly associated with a lack of vitamins or a mineral deficiency. In discussing the case, however, he stated that the goats were sucking their mothers and that their mothers were on a varied diet of alfalfa, corn and oats, with frequent additions of other feeds. The goats had been in the hospital for 4 days previous to the meeting and had been given cod liver oil, cow's milk and lime in addition to alfalfa and bran, but without showing any particular improvement.

Cervicitis was ably presented by Dr. H. E. Kingman, who used a great deal of packing house material for illustrating the subject.

The subject of "Tuberculosis" was handled by Dr. W. E. Howe, Chief of the Federal Quarantine work at Denver, who presented a paper showing some of the vagaries associated with cleaning up the herds of the country. He detailed many cases illustrating the points which he brought out. A demonstration of tuberculin testing, especially by the intradermal method, was presented by Drs. Stout, Dallas, McCapes and Dickey. Finally, an animal which had reacted to the intradermal test was slaughtered, the only lesion present occurring on the skin, near the knee, in the form of a nodule as large as a duck egg. It had been

expected that the cow would show a generalized case of tuberculosis, since, in spite of heavy feeding, she was quite thin. The autopsy, however, developed two badly ulcerated molar teeth, which were undoubtedly responsible for the general physical condition.

The provisions of the new tuberculin test law were discussed by Dr. Chas. G. Lamb, State Veterinarian.

The common poultry diseases were discussed by Dr. I. E. Newsom, who pointed out the reasons for the heavy losses in incubator chicks.

The Association varied the usual program on June 1st, in order to take advantage of the annual Cattle Feeders' Day, here at the College. This day was arranged for the purpose of inspecting the experiment steers which had been on feed for some months previously and were ready for market. The program was in charge of Prof. E. G. Maynard, who exhibited the steers and discussed the results of the experiment. Those presenting talks were Dan D. Casement, of Manhattan, Kansas, on "Feeding Cattle for Profit" and Edward N. Wentworth, of Chicago, on the "Relation of Consumptive Demand to Cattle Type." This combined meeting of the two groups seemed to be for the best interests of both, although the feeders far outnumbered veterinarians present.

By way of entertainment, on the first evening of the meeting a picnic dinner was enjoyed some miles west of Fort Collins. On the evening of June 1st the usual annual banquet and ball were held. On the afternoon of June 1st the program was set aside long enough to witness a very exciting baseball game between the University of Colorado and the Colorado Aggies, in which the latter won by a score of 6 to 4.

I. E. NEWSOM, *Secretary*.

Does Your Wife Know About The Women's Auxiliary?

THE VETERINARY ASSOCIATION OF NEW SOUTH WALES

The May meeting of the Veterinary Association of New South Wales was held at the Veterinary School, University of Sydney, on Tuesday, May 8th, 1923. There was a good attendance of veterinarians who listened with much interest to an illustrated address on "Recent Researches on Vitamins," by Associate Pro-

fessor Priestly, M. D., Ch. M., B. Sc. He covered progressive steps of recent researches and the audience was much alive to those researches carried out on animals and applicable to domestic stock.

Mr. Le Souef, G. M., V. S., Director of the Zoo, referred to the need for research along the lines outlined by the lecturer on the feeding of cage birds on seeds. Mr. Henry, M. R. C. V. S., Senior Government Veterinary Surgeon, was anxious that some research should be done on the relative vitamin content of our suburban and country milk, especially with regard to the changes in fodder at different seasons of the year.

Mr. Clunies Ross, B. V. Sc. (Walter and Eliza Hall Fellow), discussed the feeding of pet dogs and their habit of eating grasses when opportunity occurred. Mr. Hindmarsh, B. V. Sc., discussed the feeding of white and yellow maize, separately and in the absence of vitamin-containing food to pigs and the favorable results when the latter maize was used. This brought forward the relationship of the pigment carotin to vitamins.

Dr. Dodd, Veterinary Bacteriologist, proposed a hearty vote of thanks to the lecturers and laid stress on the advisability of not accepting, without experiment, the results of research in Europe and America, as being applicable to Australian conditions; also of results of experiments on animals such as rats, fed on foods usually consumed by humans, as being applicable to domestic stock fed on natural fodders. Dr. Seddon, Government Veterinary Bacteriologist, seconded the motion which was warmly supported by the chairman, Professor J. D. Stewart and confirmed by acclamation.

FRANK WHITEHOUSE, *Hon. Sec.*

We Want 5000 Members This Year.

THE MAHONING VALLEY VETERINARY CLUB

The Mahoning Valley Veterinary Club held its first meeting at the farm of Dr. W. Timblin, near Punxsutawney, Pa. Clarion, Elk, Jefferson, McKean, Indiana and Clearfield Counties were represented. Credit must be given to Dr. F. A. Marshall, of Indiana, Pa., for the organization of this club, which makes the thirteenth Veterinary Club in the State of Pennsylvania.

Dr. George A. Dick, of the University of Pennsylvania,

addressed the members on feeding in general and the importance of vitamins in particular.

The next meeting will be held at Brookville, Pa., on September 13, 1923.

C. M. CHRISTY, *Secretary*.

Plan To Go To Montreal, August 27-31.

The Pennsylvania Bureau of Animal Industry accomplished a very important piece of work recently when 40,000 cattle were tuberculin-tested in Mercer County, Pa. The county was made a tuberculosis-free area. The work was accomplished in two weeks. Of the animals tested, about 2% reacted.

An outbreak of malignant catarrhal fever recently occurred in Pennsylvania, but is now under control, through the efforts of the Bureau of Animal Industry of that State.

A moving picture film is being shown all over the country, taken in the operating room of the School of Veterinary Medicine, University of Pennsylvania. It shows Dr. John W. Adams performing an operation on an equine patient, secured on the table designed by the operator.

A SOUND HORSE

Little boy when asked to use the words "horse" and "cornet" in the same sentence made the following reply: "We give our horse corn at noon, and by night he has his cornet."—*Chaparral*.

EXPENSIVE

A Gothamite in Havana asked central to connect him with a certain number in New York, adding, "Tell the party who answers that I wish to speak to my bulldog."

After a brief interval, guests standing nearby heard a faint "Woof, woof!" coming from the receiver. Then central cut in sweetly, "Your time is up; that will be twenty dollars."

"Dog-gone!" growled the New Yorker, "that's ten dollars a woof."—*Boston Transcript*.

COMMUNICATIONS

THE THERAPEUTIC VALUE OF YEAST

TO THE EDITOR:

I have noted the advertisement of Fleischmann's dry yeast in the May number of the JOURNAL, especially the claims which place this product in the same class with many other over-advertised and under-proven agents which are usually advanced as "cure-alls." I would like to call attention to the report on Fleischmann's yeast which was recently made by the Council on Pharmacy and Chemistry of the American Medical Association. This report appears on page 1398 of the May 12th issue of the *Journal of the A. M. A.* I would like to direct your attention to the following portion of this report:

"In March, 1921, the Council took up the consideration of Fleischmann's Yeast on account of the extensive and extreme therapeutic claims which were made for this preparation. Since then the Council has given much attention to the subject of yeast therapy. The chairman called in consultation eminent students of nutrition and clinicians qualified to speak with authority on questions of nutrition, dietotherapy and pediatrics. The object was to determine whether the effects of yeast and yeast preparations on animals deprived of food containing vitamin B gave promise of having important therapeutic application. After a comprehensive discussion it was concluded that there is little likelihood that the administration of yeast or yeast preparations representing vitamin B concentrates will be of therapeutic value in many cases for which they are advertised. The view that there was no satisfactory evidence in favor of the therapeutic administration of yeast in most conditions for which it is advertised was concurred in by many of those who have contributed to the laboratory reports of the action of yeast or its vitamin in experiments on animals previously deprived of the growth-promoting constituents present in many foods and in yeast.

"As a result of its inquiry, the Council adopted (The Journal, April 15, 1922, p. 1146) the following principles to guide in the consideration of yeast preparations and vitamin B concentrates:

1. The claim that deficiency of vitamin B and diseases resulting therefrom are common conditions in the United States is not at this time supported by adequate, acceptable evidence.

2. The claim that yeast preparations or extracts are, in principle or in general, essentially more effective or more practical or more available means of administering vitamins than the commonly available vitamin-containing foods is not at this time supported by adequate, acceptable evidence.

3. The claim that therapy with yeast or yeast preparations has as yet more than an experimental status is not at this time supported by adequate, acceptable evidence.

"Further, the Council has adopted (The Journal, July 8, 1922, p. 135) an article on yeast preparations for inclusion in New and Nonofficial Remedies in which, among other things, it is pointed out (1) that the opportunities to obtain vitamin B through the customary foods are so abundant as to make the demand from special sources of the vitamin limited at the present time; (2) that yeast is a mild laxative, but that the cause of this laxative action has not been determined so far as one can learn; (3) that the supposed beneficial effect of yeast administration on furuncles, acne, etc., lacks substantiating evidence; (4) that such laxative effects may be expected from an anticonstipation agent; (5) that it is not clear whether live cultures of yeast may be used to change the intestinal flora, if indeed such reaction becomes desirable, and (6) that many of the conditions for which yeast and yeast preparations

have been proposed are so variable in their clinical courses and so likely to show improvement without special treatment that the elaborate claims that are made for yeast therapy for somewhat indefinite disorders must be largely discounted."

The statements contained in the advertisements are too misleading and fanciful to go entirely unchallenged, and the important points of the above report can be applied to animal health as well as the public health. I do not believe that many veterinarians will be misled into a wholesale prescription of dry yeast or like products for their patients, but it is certain that plenty of livestock and poultry raisers will spend good money on it.

As veterinarians, we can point out to such people that the essential property of yeast (vitamin B) occurs in abundance in many common animal and poultry feeds, and that they need have no concern about their stock developing a general need for yeast, either wet or dry. As for the laxative effect of yeast, the report points out that such effect can be obtained by anti-constipation agents of known action. There may be rare instances in veterinary practice where the administration of yeast might be of value, but such instances would not justify the general acceptance of the product as the panacea for all ills.

One possible source of profit has been overlooked apparently, by certain sales and advertising managers: No advertisement has appeared setting forth the necessity of feeding raisins, sauerkraut, etc., to livestock in order to furnish the daily ration of iron, certain varieties of bacteria, and what-not. The human family already faces such necessity, if one is to judge from the blatant advice which is becoming increasingly common in the advertising sections of our periodicals. It is my personal opinion that, when the diet of the human and animal population becomes so refined and concentrated as to require the daily consumption of raisins, yeast, sauerkraut and like products in order to keep well or get well, then the entire race of human and animal beings will be too far lacking in vitality to be revived by such piecayune measures. As stated in the report, the Council on Pharmacy and Chemistry voted to refuse recognition to Fleischmann's yeast, (1) because it is advertised by means of unwarranted and misleading therapeutic claims, and (2) because it is advertised to the public with unwarranted therapeutic claims that might become a detriment to the public health. Therefore, I fail to see why our profession should be asked to accept a similar product for veterinary therapeutics.

J. G. HARDENBERGH.

Rochester, Minn., May 21, 1923.

PROPOSED CHANGES OF THE CONSTITUTION AND BY-LAWS

TO THE EDITOR:

I wish to concur in the views expressed by Dr. Mayo in the May number of the JOURNAL, page 265, regarding the proposed changes in the Constitution and By-laws. Our present Constitution and By-laws were adopted at Detroit in 1916. Considerable valuable time was given to the consideration of this document. It has been in operation for the past seven years, during which time the profession has been greatly disturbed by the World War and general business depression. There are evidently a few minor changes that could be made with benefit to the organization. Is it necessary or advisable at the present time to consider the extensive and sweeping changes submitted on page 780 of the March number of the JOURNAL of this year? If so, why?

Those of us who were not present at the recent meetings of the Executive Board and Revision Committee have not been informed of the defects in the present Constitution and By-laws or the needs of the sweeping changes proposed. It would appear to one on the outside that for some unknown and mysterious reason the association was persuaded to authorize the appointment of a committee to provide for a closer affiliation between the A. V. M. A. and local, state, and provincial associations. Considerable attention was given this subject during the preparation of the present Constitution and By-laws.

It has been nearly a year since the Revision Committee was appointed and less than three months since their proposition to change the By-laws was published. It would appear that the plan published in the March issue of the JOURNAL is a substitute for the proposition presented at the St. Louis meeting. Are we now to expect that one of the main attractions on the program at Montreal will be a lengthy presentation and discussion of a proposition to change the Constitution and By-laws which has not been proposed in accordance with Article VI of the present Constitution?

The offices of Secretary and Editor of the JOURNAL have recently been combined and a full-time man appointed. Would it not appear more desirable to give this plan a fair trial and help the new Secretary-Editor develop the present organization, than to begin at once to clutter up the machinery by a lot of new and untried legislation?

C. J. MARSHALL.

Philadelphia, Pa., May 28, 1923.

IN REBUTTAL

TO THE EDITOR:

"Quem Jupiter vult perdere, dementat prius." I have read with much satisfaction the scurrilous outburst of the Sage of Goshen in the May number of the Journal. I hope that it will be carefully read by every member and especially by the Executive Board of the A. M. V. A. My article in the March number succeeded beyond my fondest hopes in causing the Sage to expose so fully to his colleagues the sort of man he is. Usually men of that type are pachyderms, and it is no small accomplishment to "get under their skins" without descending to their mental and ethical level.

The Sage falls into the common error of regarding all criticism as destructive and personally unfriendly. If he will consult any good dictionary he will discover his mistake. It is quite true that there was, and was intended to be, a good deal of unfavorable criticism in my article. A radical operation on a case of cancer is frequently destructive to a marked degree. The only real enemies with which our profession has to contend are internal; they are charlatanism and ignorance, which are so often embodied in the same individual.

SEPTIMUS SISSON.

Columbus, Ohio, May 21, 1923.

Does Your Wife Know About The Women's Auxiliary?

VETERINARY CORRESPONDENCE COLLEGE

TO THE EDITOR:

Concerning the matter of the Veterinary Correspondence College, referred to editorially in the May JOURNAL, allow me to state that in Great Britain and Ireland they have what are called "grinders," to help prepare for examinations. On an average about 30 percent fail in the different classes A, B, C and D, as they are called. The entrance examination is also a great deal more difficult than it formerly was. It is simply a "grinders' college," without any authority to grant degrees. I believe the best veterinary school for English-speaking students is in Dublin. I lived in Ireland from May 1912 to July 1916 and I know the profession stands higher there than here. It is the same Examining Board for all the schools.

RICHARD EBBITT, M.R.C.V.S.

Papillion, Nebr., May 25, 1923.

VETERINARY CONDITIONS IN THE NORTHWEST

To the Editor:—

Due to an extensive advertising campaign by railroads featuring the "Wonderland of America," which embraces the Northwest adjacent their railroads, the writer has received several inquiries from veterinarians in regard to conditions out here.

In the first place, this reading matter should be taken with large doses of sodium chloride. Advertising experts can take a large western desert, or a tract of land covered with burnt-over timber, and grow almost everything—on paper. The writer has traveled in every county in Washington, Idaho, most of Montana and Oregon, some of Utah and California, and the past fourteen years have taught him something about the scenic west.

It is true we have a beautiful country, and we would all be millionaires if we could live on scenery, but how many of the drawbacks are mentioned? In the first place, most of the good land has been taken up for many years. A man now taking a homestead on "dry land" or "virgin, burnt-over soil" is merely gambling with Uncle Sam, and the latter holding marked cards. Occasionally some hardy Scandinavian family, with a large bunch of hard-working children, carve out a good living, but it is at a terrific sacrifice.

Another thing to remember is our freight rates. We are so far from markets, and so many different phases enter into conditions, that it is amazing what the rancher is up against. Take, for instance, in southern Idaho, hay will sell for \$6, and cannot be sold for any price at times. In northern Idaho, it may cost \$24, due to high freight rates. In Idaho we have had over 65 bank failures the past two years. We have had only one good crop since 1917. We have had thousands of hard-working ranchers lose everything. Sheepmen went broke by the score, but that industry is coming back. Cattlemen wonder how long the banks will carry them.

Very little horse-breeding, and no price for horses, except good teams for lumber mills. In fact, the only thing that has paid any profit at all has been the dairy cow and the old hen. Last year, the apple growers were up against it on account of a certain railroad being unable to take care of their apples. With weather conditions, traffic conditions, financial conditions all upset, and our agricultural producers making less than a decent living, although working hard, another condition works against the veterinarian, and that is the automobile.

In the state of Washington, there are some 350 veterinarians registered; in Idaho almost 100. Only about half of these are in practice, and even they are only making a living. Small animal and dairy practice are the only paying branches at the present time. Veterinarians living in good agricultural centers, of course, have a fair mixed practice, but mighty few. Federal and state activities are numerous. The practitioner sees the best of work being done by salaried men.

Patent medicine vendors travel all over the country selling their unrivalled products to the horny-handed sons of toil, ranging from colic mixtures to sure cures for contagious abortion. College experts hand out free advice, and teach the laity how to "use the needle." County agents give free demonstrations on how to do your own veterinary work. The taxpaying practitioner, of course, pays his share for all these experts, and sees them doing what should be done by him in order to make a decent income.

It is western boosting literature that attracts the "suckers." Chambers of commerce from little towns send out glowing pamphlets that must make Ananias turn over in his grave. Instead of reading and absorbing these, write to some reputable veterinarian in the Northwest for his idea of correct conditions. Above all things, don't come out West, drop into some burg, get in the toils of the ever present real estate agent, and invest your hard earned savings until your tenderfoot days are over.

The West has its advantages and disadvantages, like every place else the writer has ever seen. To portray the dark side of practice as now found in the Northwest and to answer numerous questions, has been the aim of this article. State veterinarians in the Northwest who are conversant with conditions in their respective states are: Dr. L. C. Pelton, Olympia, Washington; Dr. Wendell R. Smith, Boise, Idaho; Dr. W. J. Butler, Helena, Montana; Dr. W. H. Lytle, Salem, Oregon.

The best way to find out actual conditions in any locality is to drop in quietly; keep away from the newspapers, and then engage in conversation with actual workers—not the loafers who populate Main Street and emit sage advice on how the President should run the country, but the average farmer, business man, professional man or in any other line of work. They will tell you, truthfully and frankly, their problems and the disadvantages of their community. They will not knock their home town, but they will not paint the rainbow. The longer you live in that town, the more you will find they have told you the truth. Remember

the average western town has never under-valued itself, and a typical western real estate agent is a combination of a hypnotist, good fellow, buckaroo, and very careless with the English language.

E. T. BAKER.

Moscow, Idaho, May 26, 1923.

Have You Secured One New Member This Year?

FLAT WARTS

TO THE EDITOR:

H. Fox, M. D., of New York, has recently published a report upon the treatment of human patients for flat warts, by the internal administration of mercurous iodid tablets, in doses of $\frac{1}{4}$ grain, three times daily for adults. In five out of ten cases treated, the warts disappeared in from three to eight weeks.

We hope some veterinarians will give this method of treatment a trial in treating warts on animals, and report in the Journal of the A.V.M.A.

N. S. MAYO

Chicago, Ill., May 22, 1923.

UNCLE SAM WIN'S SUIT

The U. S. Department of Agriculture recently conducted a successful prosecution, under the Pure Food and Drug Act, against the John Dobry Manufacturing Company, of Cedar Rapids, Iowa. This concern, for several years, has been marketing a fake hog cholera remedy, containing a few common drugs and a large amount of arsenic. The State of Iowa had previously brought suit against this concern, although unsuccessfully, for misbranding packages and making false statements.

Former editors of the Journal, and the present editor as well, have been criticised for allowing certain advertisements to appear in these pages. It sometimes happens that we can not be as particular, in certain respects, as we would like to be, in the matter of selecting and censoring advertisements. The fact remains, however, that so far as the present editor is concerned, our advertising pages will not be defaced with the ads of any chiropractic college.

MISCELLANEOUS

A NEW DEAN AT EAST LANSING

A long-hoped-for amalgamation of departments at the Michigan Agricultural College, which should substantially strengthen the Veterinary Division of that College, was consummated by a recent action of the State Board of Agriculture. By this action the academic and investigational work in parasitology, physiology, bacteriology and hygiene has been transferred to the Veterinary Division. Formerly these subjects have been administered either in the Agricultural or Applied Science Divisions.



DR. WARD GILTNER

Some time ago Dr. F. W. Chamberlain, who for the past four years has been Acting Dean, asked to be relieved of this duty. This request was granted and acknowledgment was made by the Board of its gratitude to him for his faithful services during this period.

Under the amalgamation Dr. Ward Giltner, who has been

head of the Department of Bacteriology and Hygiene, since 1912, has been made Dean. Dr. F. W. Chamberlain will continue to head the Department of Comparative Anatomy.

The new arrangement should be instrumental in establishing a very close relationship between the allied divisions at the college. It should make for efficiency in investigational work in animal diseases, in that the work will be coordinated. Formerly part of this work was done by the Department of Animal Pathology, in the Veterinary Division, and part by the Department of Bacteriology and Hygiene, entirely without the Division. While the work given in parasitology and physiology will undoubtedly not be changed materially, it is felt that under the administration of the Veterinary Division that part of the work pertaining to veterinary science can be emphasized and developed.

Does Your Wife Know About The Women's Auxiliary?

MUCH IMPROVED



DR. W. H. DALRYMPLE

We are indebted to Dr. Harry Morris for the accompanying snap-shot of our good friend, Dr. W. H. Dalrymple. If there are any of his many friends who are wondering about the present state of his health, just take a look at the picture, which was forwarded under date of May 10th, with the word that Dr. Dalrymple's health was much improved. We think a trip to Montreal, about the latter part of August, is about the only further treatment to be prescribed in his case.

Have You Secured One New Member This Year?

NECROLOGY

SAMUEL BEATTY PATTERSON

Dr. S. B. Patterson died at his home in LaCrosse, Wisconsin, February 26, 1923, in his 59th year, after an illness of 13 days. The cause of death was lobar pneumonia.

In his early twenties Dr. Patterson became interested in veterinary medicine, and studied under Dr. W. P. Martin, of River Falls, Wis. The latter moved to La Crosse, in 1889, and Dr. Patterson accompanied him. Years later he entered the McKillip Veterinary College, and graduated in 1910, at the age of 46. He was associated in practice with his brother, Dr. G. W. Patterson.

Dr. Patterson was a member of the American Veterinary Medical Association, having joined in 1919. He was also a member of the Wisconsin Veterinary Medical Association. He was a member of the Yeoman, Ben Hur, Modern Woodmen and Masonic lodges. The funeral was conducted under Masonic auspices.

Well and favorably known in La Crosse and the surrounding territory, Dr. Patterson leaves a host of friends, many of whom can recall acts of kindness done them by the deceased, at various times in his useful life. He is survived by his brother, Dr. G. W. Patterson, two sisters and a niece.

CLAIRE NEWTON HACKETT

Dr. Claire N. Hackett, of St. Paul, Minn., died March 9th, 1923. The cause of death was heart trouble, with which he had been afflicted for several years.

Dr. Hackett was born near Tallmadge, Ohio, June 18, 1883. He attended common and high schools of his district, and received his veterinary training at Ohio State University, graduating in 1906. He married Augusta Wendorff, of Minneapolis, February 2, 1909, to which union one daughter, Gloria, was born.

Following graduation, in 1906, Dr. Hackett went to Minnesota, to accept a position as Field Veterinarian, for the Minnesota State Live Stock Sanitary Board, under the late Dr. S. H. Ward. One year later he entered the service of the Bureau of Animal Industry and was assigned to South St. Paul. In 1909 Dr.

Hackett spent the summer in Wyoming and Idaho, engaged in field work, returning to South St. Paul in the fall, when he was appointed Veterinary Inspector in the Union Stock Yards. In 1918 he was promoted to Supervising Veterinary Inspector, which position he held at the time of his death.

Dr. Hackett joined the American Veterinary Medical Association in 1917. He was also a member of the Minnesota State Veterinary Medical Association. He was ex-president of the South St. Paul branch of the National Association of B. A. I. Veterinarians. He was a member of Braden Lodge A. F. and A. M., and St. Paul Consistory No. 1. The funeral was conducted from the Masonic Temple and the body was laid to rest in Lakewood Cemetery, Minneapolis. Dr. Hackett was one of the most popular men connected with the South St. Paul Union Stock Yards, and every business concern in the city was represented at the funeral.

Dr. Hackett is survived by his widow, daughter, father, mother, and brother and one sister.

R. T. WHITTLESEY

Dr. R. T. Whittlesey, of Los Angeles, Cal., died May 1, 1923, at the age of 62 years. He was a native of New York State and as a small boy moved to Emporia, Kansas. He attended one session at the Montreal Veterinary College, then another at the Columbia Veterinary College, of New York City, from which institution he graduated in 1883. It is reported that Dr. Whittlesey, with his wife and three children, drove a span of mules and a covered wagon overland, when he went to California in 1884. He located in Los Angeles, where he continued to live, and practiced up until a few years ago, when he became the victim of locomotor ataxia. For some time previous to his death he was practically helpless.

Dr. Whittlesey was prominent in veterinary affairs of California for many years. He was at one time a member of the California State Board of Examiners in Veterinary Medicine. He was a member of, and served as President, both the California State Veterinary Medical Association and the Southern California Veterinary Medical Association. He joined the American Veterinary Medical Association in 1911.

H. H. CLEMENT

Dr. H. H. Clement died at his home, 215 Seward Street, Hudson, Mich., May 12, 1923. He had not enjoyed good health for some time. He was 64 years of age.

Dr. Clement graduated from the Ontario Veterinary College, in 1882. Of the forty years during which he was in active practice, 32 years were spent in Hudson. He was a charter member of the Michigan State Veterinary Medical Association. At the recent meeting of the Association, in February, Dr. Clement was made a life member, along with Drs. Brenton, Whitney and Dell, the latter of whom died about two months ago.

With the death of Dr. David Cumming, in January, Dr. J. A. Dell, in March, and Dr. Clement in May, three of the charter members of the Michigan State Veterinary Medical Association, organized in 1883, have been taken away during the present year.

Dr. Clement was a member of Lebanon Lodge, No. 26, F. & A. M., Phoenix Chapter, No. 99, R. A. M., and Putnam Council, No. 16, R. & S. M., of Hudson. He is survived by his widow, one daughter, one brother and two sisters.

DANIEL McCUAIG

Dr. Daniel McCuaig, of Ottawa, Canada, died May 26, 1923. Death was the result of a paralytic stroke.

Following his graduation from the Ontario Veterinary College, in 1892, he practiced in Ottawa for a few years and then moved to Moncton, New Brunswick, where he practiced until 1907. In that year he was appointed a Veterinary Inspector of the Health of Animals Branch, Department of Agriculture, Canada, and soon after this appointment was placed on the New Brunswick frontier, with headquarters at McAdam Junction, to enforce the regulations governing the importation of live stock from the United States. On account of ill health Dr. McCuaig was obliged to retire, October 1, 1922.

Dr. McCuaig joined the American Veterinary Medical Association in 1903. He always took a keen interest in the veterinary profession and attended several of the A. V. M. A. conventions at distant points in the United States. He was reserved and quiet in his manner, but was always a big-hearted veterinarian, ever ready to assist in anything that was for the betterment of his chosen profession. Dr. McCuaig is survived by his widow.

DR. I. I. SCHMIDT

In the June issue of the *Veterinary Journal* (London) announcement is made of the death of Dr. I. I. Schmidt, of Kolding, Denmark, the originator of the present successful treatment for milk fever of cattle. Dr. Schmidt was elected to honorary membership in the American Veterinary Medical Association in 1907.

We Want 5000 Members This Year.

ON THE SICK LIST

Dr. D. Henderson (Ont. '87), of Niagara Falls, Ont., has been very ill for over a year. He is now in a sanatorium and fears are expressed that he may not recover.

Dr. J. H. Tennent (Ont. '74), of London, Ont., is reported to be seriously ill with arterio-sclerosis.

Dr. M. E. Knowles (A. V. C.), of Helena, Mont., former President of the A. V. M. A., is also reported as being ill with arterio-sclerosis.

Dr. Samuel Brenton (Ont. '80), of Detroit, Mich., another former President of the A. V. M. A., has been quite ill, at his home, for several weeks. He contracted a heavy cold about the middle of May. At last reports he was doing nicely.

Dr. Robert Armstrong (Det. '97), also of Detroit, has been in the hospital for several weeks, on account of a serious illness, in connection with which it was found necessary to perform a serious operation.

Dr. James Drury (Ont. '91), of Ypsilanti, Mich., was recently a hospital patient, with a serious gastro-intestinal disturbance.

Plan To Go To Montreal, August 27-31.

BIRTHS

Dr. and Mrs. E. A. Horner, of Akron, Colo., a daughter, Mildred Elinor, March 29, 1923.

Dr. and Mrs. R. C. Mills, of Redfield, Iowa, a son, Clipper Eugene, March 26, 1923.

Dr. and Mrs. K. H. Gulser, of Adel, Iowa, a daughter, Shirley Jean, May 29, 1923.

Dr. and Mrs. F. W. Collins, of Madison, Nebr., a daughter, Clara Jean, April 5, 1923.

Dr. and Mrs. D. F. Studebaker, of Lucerne, Mo., a son, James Robert, March 18, 1923.

Dr. and Mrs. W. W. Pease, of Meadville, Pa., a son, Robert William, Jan. 8, 1923.

Have You Secured One New Member This Year?

MARRIAGES

Dr. Melvin R. Sebright (St. Jos. '16), of Crofton, Nebr., and Miss Sylvia Barbara Brandfas, of Hugo, Colo., at Omaha, Nebr., March 29, 1923.

Dr. H. T. Ludwig, (O. S. U. '13) and Miss Gladys Kope, of Louisville, Ky., June 2, 1923. At home, 2112 W. Broadway, Louisville, Ky.

Dr. Miller F. Barnes (U. P. '11), of Philadelphia, Pa., and Miss Elizabeth C. Lewis, of Broomal, Pa., June 2, 1923.

Does Your Wife Know About The Women's Auxiliary?

PERSONAL

Dr. Robert W. Pechin (U. P. '16) is Burgess of Pnoenixville, Pa.

Dr. H. S. Webber has been transferred from Jersey City, N. J., to Lancaster, Pa.

Dr. R. G. Kerans has left Kentucky and is again in practice at Leesburg, Ohio.

Dr. Jaime Bague (U. P. '14) is an officer in the Department of Agriculture of Porto Rico.

Dr. Curtis A. Fridirici (U. P. '21) has removed from Tamaqua, Pa., to Fogelsville, Pa.

Dr. John J. Shelly (U. P. '20) has changed his location from Storey Run, Pa., to Hellertown, Pa.

Dr. N. J. Pearce (K. C. V. C. '13) has removed from Monticello, Ark., to Bentonville, same state.

Dr. Geo. E. Rothenberger has associated himself with the St. Lawrence Dairies, at Reading, Pa.

Dr. A. W. French has been appointed State Veterinarian of Wyoming, succeeding Dr. B. F. Davis.

Lt. Harry E. Van Tuxl (K. S. A. C. '17) has been transferred from Chicago, Ill., to Fort Ringgold, Texas.

Major Luis A. Beltran (U. P. '08), of the Cuban Army, has been transferred from Marianao to Havana.

Dr. John I. Handley (Ala. P. I. '13), of Atlanta, Ga., attended the recent Shriners' Convention, in Washington, D. C.

Dr. A. K. Zellner (Corn. '18), has succeeded Dr. L. V. Polk (Corn. '08) as chief veterinarian of the Dairymen's League.

Dr. Charles V. Pearce, of Coatesville, Pa., was recently bitten by a rabid dog and had to take the Pasteur treatment.

Dr. H. H. Collins (Chi. '17), of Elizabethtown, Pa., has been made Assistant City Meat and Milk Inspector, of Reading, Pa.

Dr. Earl E. Romberger (U. P. '21) was recently appointed to the position of Chief Meat and Milk Inspector, of Reading, Pa.

Dr. W. P. Shoaff (Ind. '20) has removed from Weldon, Ill., to Paris, same state. His address is 224 E. Washington Street.

Dr. T. O. Scott (K. C. V. C. '12) has left Marlin, Texas, and located in Waco. He gives his address as 1915 Herring Ave.

Dr. M. M. Davis (McK. '15), has been transferred from Chicago, Ill., to South St. Paul, Minn. His new address is 334 Fourth Avenue, South.

Dr. E. T. Baker (Ohio '09), our ovine specialist, made a trip to the Pacific Coast, in April, as a member of the Moscow (Idaho) Elks Bowling Team.

Dr. Ralph W. E. Daniels (U. P. '21) has gone to the Pocono Mountains for the benefit of his health. His many friends wish him a speedy recovery from his illness.

Dr. L. E. Lyons (Ohio '11), has been transferred from Tallahassee, Fla., to Little Rock, Ark., where he is engaged in Tuberculosis Eradication work for the B. A. I.

Dr. H. J. Shore (Geo. Wash. '11), Laboratory Director of the Fort Dodge Serum Co., has been elected an honorary member of the Webster County (Iowa) Medical Society.

Dr. W. O. McHugh (Ont. '97), formerly at Cleveland, Ohio, has been transferred to Zanesville, Ohio, and is now in charge of meat inspection there. Address c/o Y. M. C. A.

Dr. Eugene Ferron (U. P. '14) who has been connected with the Department of Agriculture of Ecuador, S. A., has returned to this country and is making his home in Philadelphia.

Dr. J. W. Fuller (Corn. '21), who has been doing special work on poultry diseases, has resigned from the New York State Veterinary College to take up practice in connection with poultry diseases.

Dr. B. Scott Fritz (U. P. '17) has just received a promotion which necessitated his leaving Philadelphia, to go to Harrisburg, Pa., in connection with his work with the State Bureau of Animal Industry.

Dr. C. T. Higginbotham (Cin. '18) has been transferred from Hog Cholera Control work, in Nebraska, to the Meat Inspection Division, at Chicago. His address in the Windy City is 5057 South Ashland Avenue.

Dr. A. J. De Fossett (Ohio '07) has been transferred from Vermont to North Carolina, with headquarters at Raleigh. Dr. De Fossett made a splendid record in Tuberculosis Eradication work in the Granite State.

Dr. V. A. Moore was in Washington recently in conference with Drs. Mohler and Kiernan relative to the testing of cattle in Cattaraugus County, in cooperation with the efforts of the Milbank Memorial fund there.

Dr. H. W. Wilson (Chi. '15), our energetic Resident Secretary of Arkansas, recently took the Pasteur treatment, made necessary by coming into too close association with a canine patient, suspected of having "black tongue." It turned out to be rabies.

Drs. W. G. Hollingworth, of Utica, N. Y. and E. V. Moore (Corn. '17), of Cortland, N. Y., gave addresses on practical phases of veterinary practice before the students of the New York State Veterinary College, during the months of April and May.

Dr. George W. Rawson (U. S. '16) recently completed a year's course of study in post-graduate work, at Johns Hopkins University, and has accepted a position in the Department of Animal Industry of Parke, Davis & Company, with headquarters at Detroit.

Dr. Carl Viers (St. Jos. '14) was recently elected Mayor of Vermillion, South Dakota. Besides being Mayor and a busy practitioner, Dr. Viers is President of the Shrine Club, Worthy Patron of the Eastern Star and Master of the Masonic Lodge of Vermillion.

Capt. Raymond A. Kelser (Geo. Wash. '14) received the degree of Doctor of Philosophy, at the ninth Convocation of the American University, Washington, D. C., May 29, 1923. The subject of Capt. Kelser's thesis was "A Study of Rabies from the Standpoint of Etiology and Diagnosis."

Dr. John B. Knapp (Corn. '02), of Cortland, N. Y., was elected chairman of the organization of veterinarians of Cortland County at their meeting held June 6th. It was decided to hold monthly meetings for the purpose of discussing subjects of common interest to the profession and live stock owners of the country.

Dr. Carlton J. Morgan (Corn.) has recently been appointed Dairy and Food Inspector for the Department of Public Health and Vital Statistics, City of Kenosha, Wisconsin. Before accepting the above-mentioned position Dr. Morgan was Food Inspector in the Bureau of Animal Industry, at Somerville, Massachusetts.

Dr. L. H. Smith (Ohio '15), for eight years Field Veterinarian with the Ohio Department of Agriculture, and more recently in charge of abortion and sterility work in the herds connected with Ohio's various institutions, has accepted a position with the Detroit Creamery Company, and will have charge of the veterinary work in connection with their certified herd of 800 head, at Ingleside Farm, near Mt. Clemens, Mich.

Dr. H. J. Metzger (Corn. '18) veterinary extension specialist in the Department of Animal Husbandry, New York State College of Agriculture, at Cornell University, is spending a month at the University of Wisconsin. His object is to secure first-hand information relative to the methods of conducting, and results secured from, the research work with animals, which is being carried on in the Wisconsin College of Agriculture. He will spend the major portion of his time with the Departments of Agricultural Chemistry and Veterinary Science.

Dr. Earl A. Hewitt (Iowa '18), Instructor in Veterinary Physiology, at the University of Minnesota, has just been honored by election to Sigma Xi, in recognition of his research work in the field of physiology and physiological chemistry, particularly his work on the elimination of hippuric acid by the kidneys. Dr. Hewitt received his A. B. from Des Moines University, in 1914; his B. S. from Iowa State College, in 1915; and his D. V. M. from the same institution, in 1918. He was elected to Phi Kappa Phi the same year. He has been at the University of Minnesota since the fall of 1919.

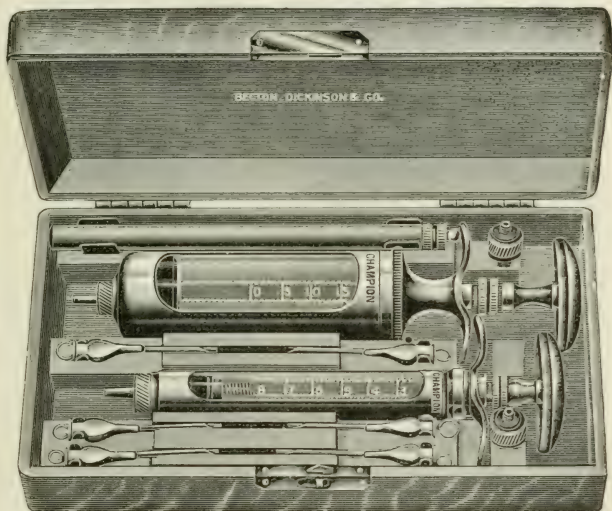
Dr. John T. E. Dinwoodie (U. P. '13) has been appointed editor of The Dakota Farmer, one of the leading agricultural papers of the Northwest. Dr. Dinwoodie was a member of the Veterinary Staff of the University of Minnesota for several years after his graduation from the University of Pennsylvania, engaged in hog cholera work. He then went to the South Dakota Agricultural College, as Extension Specialist in Animal Disease Control. In 1918 he joined the staff of The Dakota Farmer as live stock editor. Three years later he was made associate editor. Dr. Dinwoodie's word goes a long way with the live stock interests in South Dakota.

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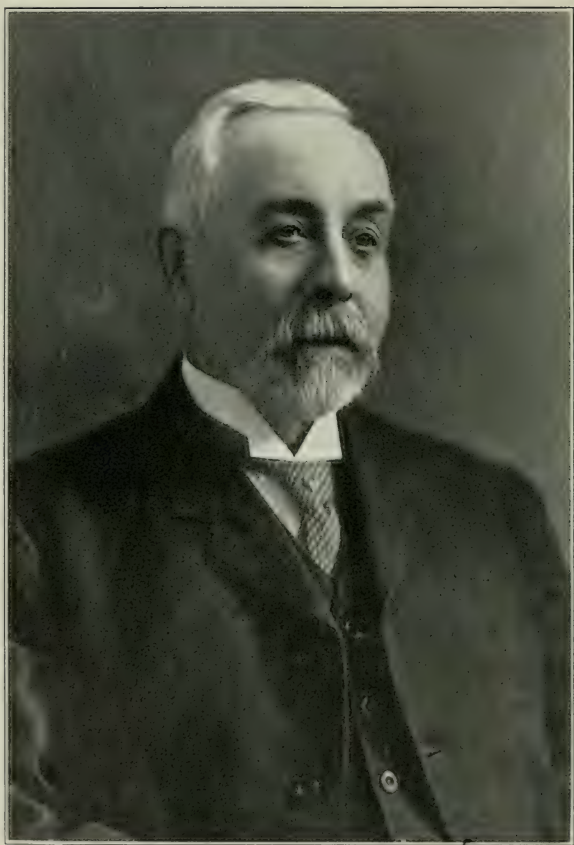
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DUNCAN McEACHRAN, LL. D., F. R. C. V. S.

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August, 1923

No. 5

ORMSTOWN, P. QUE

10th July 1923

In 1875, hale and hearty I was present at the Convention held at Philadelphia when the A. V. M. A. was about debuting.

Today although not feeling quite as well, nevertheless I see with pleasure the A. V. M. A. strong and prosperous, celebrate its "Diamond Jubilee" in Montreal, and I urge every veterinarian to attend its meetings and help to carry on the good work to which I have devoted over fifty years of my life.

"Vis Unita Fortior"

Duncan McEachern

ON TO MONTREAL

As the time for the Montreal meeting approaches, the signs more and more indicate that the 1923 gathering will be a memorable one. Marking, as it will, the sixtieth anniversary of the organization of the parent body, the United States Veterinary Medical Association, which, thirty-five years later brought forth a lusty youngster, the American Veterinary Medical Association, the Montreal convention is pregnant with possibilities.

Our Canadian brethren will leave nothing undone which might contribute to our pleasure while in their historic city. Of that we are amply assured. Distinguished international guests, through their presence, will add luster to the occasion. A glance at the literary program shows that a number of the leading lights of the veterinary profession in America will contribute their findings and the benefits of their experience and observations, at the several sessions, both general and sectional. The social side



Windsor C.P.R. Station
Montreal

COURTESY CANADIAN PACIFIC RAILWAY

of the program has not been overlooked, with the President's reception, the alumni gatherings, the banquet and the boat-ride.

But let us not forget that we are going to Montreal with a really serious purpose. There will be a business end to the program. Those who will not be able to attend the meeting will eagerly await a report of the transactions. The eyes of every practitioner will be on Montreal during the last week in August. They are expecting something to be done of distinct benefit to them, something to better conditions for them. Something will be done.

Our organization has occasionally been censured, sometimes unfairly, for things that have been left undone. There is entirely too much of the perfectly natural tendency to forget or to overlook the great amount of constructive work that has been done by our Association in the past. But these accomplishments of the past are the very best standards we have by which we may judge of what we can bring to pass in the future.

We have had a *purpose* ever since we were organized. It is plainly stated in the preamble of our Constitution. We are about to have a *policy*, something that we apparently have been content to get along without. With a definite policy decided upon, the next thing, and much more important, is a *program* for carrying out our policy.

As someone has so pertinently put it, this is a period of publicity, press-agents and propaganda. The statement was recently made to the effect that the veterinary profession has received more favorable publicity, during the past six months, than at any time in the past. This publicity will be for naught unless we continue to deserve it. We must keep this constantly in mind. We are the servants of the owners of the live stock in our respective communities. Upon their prosperity largely depends our well-being. Without a live stock industry there would be no need of a veterinary profession.

If we have any differences among ourselves, let us discuss and settle them among ourselves. Even though, as is so often said, our Association is made up of many different groups,—practitioners, Bureau men, State men, college men, army men, laboratory men, commercial men,—let us not forget, that as veterinarians, we have a common purpose, after all.

We Want 5000 Members This Year.

THE CONVENTION CITY OF 1923

Montreal, the largest and wealthiest city in Canada and the commercial metropolis of the Dominion, is situated on an island of the same name at the confluence of the St. Lawrence and Ottawa rivers. It is at the head of ocean navigation on the St. Lawrence, 936 miles from the Atlantic, a seaport city nearly a thousand miles inland! In 1535 the site of the present city was visited by Jacques Cartier, who found a populous Indian village of the Huron-Iroquois tribes known as Hochelaga. Climbing the mountain, he was so charmed by the prospect that he gave the place its name of Mount Royal—the Montreal of today. In 1611 the French, under Champlain, planted their first post on the Island where the Montreal Custom House now stands, and called it "La Place Royale." In 1642 Monsieur de Maisonneuve founded it as a city.



The city is rich in historical associations but it is not within the scope of this short article to trace the past—the Montreal of today is a busy, thriving city of nearly 900,000 population. It is the gateway for a nation's commerce. Fine wharves, mammoth grain elevators and a well-dredged channel have made it one of the finest harbors in the world, and as a port of departure for European travellers it has the unique distinction of affording the shortest route to Europe, there being only 4½ days of open water by this route. For nearly a thousand miles the voyager is in the land-locked waters of picturesque river and gulf, and when the



dim outlines of the fading shores mark the conclusion of the wonderful panorama, the fascinating journey is one-third over.

Visitors to Montreal may spend days sight-seeing and taking in the various points of interest throughout the city. Some of these are:

- The Harbor.
- Custom House.
- Redpath Museum.
- Dominion Square.
- Lafontaine Park.
- Laval University.
- Mount Royal Park
- Bank of Montreal
- McGill University.
- St. James Cathedral.
- St. George's Church.
- Stratheona Monument.
- Jacques Cartier Square.
- Victoria Jubilee Bridge.
- Government Grain Elevator.
- Admiral Nelson's Monument.
- City Hall and Court House.
- Art Gallery, Sherbrook St.
- Site of La Salle's Residence.
- Notre Dame de Lourdes Chapel.
- Statue of Queen Victoria, Victoria Square.
- Canadian Northern Tunnel under Mount Royal.

Grand Cathedral of Notre Dame, second largest church on this Continent and the largest bell in America.

Chateau de Ramezay, residence of French and British Governors, and headquarters of the American Army, 1775.

Landing Place of Paul de Chomedey, Sieur de Maisonneuve, and the first founders of Montreal in 1642.

TWENTY-FIVE YEARS AGO

On the thirty-fifth anniversary of the United States Veterinary Medical Association was born the American Veterinary Medical Association at Omaha. It enters upon its career in the height of manhood, at the zenith of National Association power. The history of the United States Veterinary Medical Association has been made and recorded, and with many trials and vicissitudes counted among its experiences, yet the Association under its new name owes all its acquired strength and power to its parent. Reared and fostered in the earliest history of veterinary science in our land, it has counted among its list of members the strongest and most progressive members of the profession. On its roll of membership may be found the names of those who have led in the roll of advancement and progress in every aspect of our professional progress.

In teaching, in higher professional attainment, in the field of surgery and medicine, in journalism, in the building up of American veterinary literature, her members have attained honor, fame and renown, and these priceless records fall to the heirship of the new and broader Association. This history, these records of work well done, these achievements of our profession in nation, state and city, come to the Association of the future, charged with weighty responsibilities for us to carry and discharge with equal fidelity. Well it is that we can say and feel that in the All Americas now to make up our organization, the strength in numbers and in individual power never was greater and more united in the common purpose that keeps us together—of bettering our profession; and the future will, as surely as the passing of the noonday sun of to-morrow, write on its pages a record of greater advancement, progress and power.

Let the veterinarians of the All Americas now add their strength and worth to the American Veterinary Medical Association, and veterinary sanitary science, surgery, medicine, education, journalism and allied branches of our work will move forward with rapid strides and fittingly close the work of the nineteenth century. (*Editorial reprinted from the Journal of Comparative Medicine and Veterinary Archives, September 1898*).

OUTLINE OF PROGRAM

MONDAY, AUGUST 27, 1923

- MORNING —General session. Address of Welcome.
Response. President's address.
- AFTERNOON—General session. Reports of Executive Board,
Officers and Committees. Election of new mem-
bers.
- EVENING —President's Reception.

TUESDAY, AUGUST 28, 1923

- MORNING —Sectional meetings.
- AFTERNOON—General session. Reports of Committees. Elec-
tion of officers. Meeting of Women's Auxiliary.
- EVENING —Meeting of college alumni associations, clubs, etc.

WEDNESDAY, AUGUST 29, 1923

- MORNING —Joint session of Sections on Education and Re-
search and Sanitary Science and Police. Clinic,
Section on General Practice.
- AFTERNOON—Clinic continued.
- EVENING —Banquet.

THURSDAY, AUGUST 30, 1923

- MORNING —General session. Papers and addresses.
- AFTERNOON—Trip to MacDonald College, by special train.
- EVENING —Moonlight Excursion on St. Lawrence River.

FRIDAY, AUGUST 31, 1923

- MORNING —Sectional meetings.
- AFTERNOON—General session. Reports.
Unfinished business. Installation of Officers.
Adjournment.

Does Your Wife Know About The Women's Auxiliary?

PAPERS

TUESDAY MORNING, AUGUST 28, 1923

SECTION ON SANITARY SCIENCE AND POLICE

- Chairman's Address, Dr. R. C. Reed, College Park, Md.
- Secretary's Report, Dr. Orland Hall, Ottawa, Canada.
- "The Practical Value of Serological Tests in the Control of

Infectious Abortion," by Dr. J. W. Connaway, University of Missouri, Columbia, Missouri.

"Excessive Pig Losses Can be Prevented," by Dr. A. T. Kinsley, Kansas City, Missouri.

"The Control of Internal Parasites of Swine," by Dr. Maurice C. Hall, Zoological Division, Bureau of Animal Industry, Washington, D. C.

SECTION ON GENERAL PRACTICE

Chairman's Address, Dr. H. E. Kingman, Fort Collins, Colo.

Secretary's Report, Dr. Harry Caldwell, Wheaton, Ill.

"Cesarian Section in the Cow," by Dr. T. H. Ferguson, Lake Geneva, Wis. Discussion to be opened by Dr. H. E. Bemis, Ames, Iowa.

"Cervical Surgery," by Dr. W. W. Williams, Springfield, Mass. Discussion by Dr. A. Savage, of Winnipeg, Manitoba.

"Sterility of Mares," by Drs. W. W. Dimock and E. A. Caslick, University of Kentucky, Lexington, Ky.

SECTION ON EDUCATION AND RESEARCH

Chairman's Address, Dr. L. W. Goss, Columbus, Ohio.

Secretary's Report, Dr. E. M. Pickens, College Park, Md.

"Veterinary Science as Taught in Quebec," by Dr. F. T. Daubigny, University of Montreal, Montreal, Quebec.

"Veterinary Education and Practice in Scandinavia, with Special Reference to Norway," by Dr. H. J. Stafseth, Michigan Agricultural College, East Lansing, Michigan.

"Veterinary Education," by Dr. C. J. Marshall, University of Pennsylvania, Philadelphia, Pa.

WEDNESDAY MORNING, AUGUST 28, 1923

JOINT SESSION

SECTION ON SANITARY SCIENCE AND POLICE

AND

SECTION ON EDUCATION AND RESEARCH

"Hog Cholera Control *vs* Prevention," by Dr. I. K. Atherton, U. S. Inspector in charge of Hog Cholera work, College Park, Md.

"A Study of Rabies from the Standpoint of Etiology," by Capt. R. A. Kelser, Army Medical School, Washington, D. C.

"Controlled Vaccination Experiments on Cattle with Bacterium

Abortus," by Drs. G. H. Hart and C. M. Carpenter, University of California, Berkeley, California.

"The Injection of Cattle with B. Tuberculosis (Avian) and Results of Subsequent Tuberculin Tests," by Drs. Cecil Elder and A. M. Lee, Wyoming Agricultural Experiment Station, Laramie, Wyo.

THURSDAY MORNING, AUGUST 30, 1923

GENERAL SESSION

"The Practitioner as the Foundation of Veterinary Service," by Dr. E. R. Steel, Grundy Center, Iowa.

"Some Laboratory Findings and Conclusions Regarding the Bang Abortion Organism which Puzzle Clinicians," by Dr. W. L. Williams, Ithaca, N. Y.

"The Challenge to the Veterinary Profession," by Dr. R. L. Conklin and Prof. H. Barton, MacDonald College, Quebec. Address: Hon. Senator G. Boyer, Rigaud, Quebec.

"Corpus Luteum of the Ox Ovary in Relation to the Estrous Cycle," by Drs. H. S. Murphey and G. W. McNutt, Iowa State College, Ames, Iowa.

"Studies of the Estrous Cycle of the Ox," (Second paper) by Dr. H. S. Murphey, Iowa State College, Ames, Iowa.

FRIDAY MORNING, AUGUST 31, 1923

SECTION ON SANITARY SCIENCE AND POLICE

"A New Disease of Cattle Simulating Hemorrhagic Septicemia and Blackleg, Due to Damaged Sweet Clover," by Dr. Frank W. Schofield, Ontario Veterinary College, Guelph, Ontario.

"No-Lesion Tuberculin-Reacting Cattle," by Dr. E. C. Schroeder, Bureau of Animal Industry Experiment Station, Bethesda, Md.

"The Serum Therapy of Glanders, with Special Reference to Glanders in Man," by Dr. E. A. Watson, Health of Animals Branch, Dept. of Agriculture, Ottawa, Ontario

Election of officers.

Adjournment.

SECTION ON GENERAL PRACTICE

"Post-Vaccination Trouble," by Dr. Edward A. Cahill, Zionsville, Ind. Discussion by Drs. A. T. Kinsley, Kansas City, Mo., and R. R. Birch, Ithaca, N. Y.

"Anesthesia, General and Local," by Drs. H. E. Bemis, W. F. Guard, and C. H. Covault, Iowa State College, Ames, Iowa. Discussion by Drs. R. R. Dykstra, Manhattan, Kans., and O. V. Brumley, Columbus, Ohio.

"Mastitis: Its Etiology and Pathology," by Dr. G. E. Jorgenson, Clermont, Iowa. Discussion by Dr. L. A. Klein, Philadelphia, Pa.

Election of officers.

Adjournment.

SECTION ON EDUCATION AND RESEARCH

"The Source of Infection in Primary Outbreaks of Hog Cholera," by Dr. I. K. Atherton, U. S. Inspector in charge of Hog Cholera Work, College Park, Md.

"Bacteria of the Genital Tract of Mares and the Semen of Stallions, and their Relation to Breeding Efficiency," by Dr. W. W. Dimock, University of Kentucky, Lexington, Ky.

"Bacterium Pullorum Infection in Baby Chicks and Adult Fowls," by Dr. B. A. Gallagher, Pathological Division, Bureau of Animal Industry, U. S. Dept. of Agriculture, Washington, D. C.

"The Pathology of Posterior Paralysis in Pigs," by Dr. S. A. Goldberg, New York State Veterinary College, Ithaca, N. Y.

Election of officers.

Adjournment.

Have You Secured One New Member This Year?

IF YOU DRIVE TO MONTREAL READ THIS

If you are planning to motor to Montreal be sure that you have with you your license and registration card of the car which you drive. It will be necessary to secure a touring permit, at the point where you enter Canada. Such permits are good for thirty days and cost 50c each. A certificate of ownership of your car is not necessary, if you have your license and registration card, together with touring permit. If, for any reason, you do not plan to leave Canada, at the same point where you enter, it will be necessary for you to secure "clearance papers" at the point of entry.

IF YOU ARE GOING TO MONTREAL BY RAIL READ THIS

The Certificate Plan has been granted, but is contingent upon at least 250 of those in attendance at the meeting traveling by rail and securing certificates. These certificates should be requested when you purchase your ticket *going* to Montreal. Said certificates should be requested regardless of whether you intend to avail yourself of the reduced fare returning, and regardless of whether you intend to return home by the same route as that selected going to Montreal.

For members and visiting veterinarians attending the convention, as well as dependent members of their families, who have paid normal, one-way fares (tariff fares of 67 cents or more) on the going trip, via routes over which one-way tickets are regularly sold, will be ticketed to their starting points by the route traversed in going to the convention, at one-half of the normal one-way fare from Montreal to original starting point.

Certificates will show the purchase of tickets not earlier than dates specified by the various passenger associations, and when validated by special agent, will be honored for return ticket at one-half of the normal one-way fare, if presented not later than September 4th.

The word "Convention" will be stamped or written across the face of contracts and each coupon of all tickets sold for the return of persons attending the meeting, for which a reduced fare was authorized on the certificate plan.

Arrangements have been made to validate certificates on Wednesday, August 29th, and Thursday, August 30th. The reduced fare for the return journey will not apply unless holder of certificate is properly identified, as provided for by the certificate. Such identification will be made by the Secretary, Dr. H. Preston Hoskins, at the convention.

Secure your certificate when you purchase your ticket, and turn it over to the Secretary when you register at the meeting.

Have You Secured One New Member This Year?

BIDS FOR FUTURE MEETINGS

1924—Des Moines, Iowa.

1925—Portland, Oregon.

1926—Philadelphia, Penna.

FORTY YEARS A MEMBER

With the celebration of the sixtieth anniversary of the American Veterinary Medical Association so near at hand it seems particularly appropriate to pay a tribute at this time to a member who has been on the roll for forty years, two-thirds of the period of existence of our great organization, and during which time he has maintained a keen and active interest in the welfare of the Association and its affairs.

Dr. Benjamin D. Pierce, of Springfield, Massachusetts, joined the A. V. M. A., at the meeting in Boston, in 1883, and has been



DR. BENJAMIN D. PIERCE

a familiar figure at many of the meetings held since that time in all parts of the country. He not only attends the A. V. M. A. conventions, but he is a fairly regular attendant at the Cornell Conferences, the United States Live Stock Sanitary Association meetings in Chicago, Tuberculosis Conferences, and similar gatherings.

Born in Worcester, Mass., March 9, 1859, he moved to Springfield in 1865, and has been a prominent figure in Springfield affairs ever since. He graduated from the Montreal Veterinary College in March, 1881. Two months later found him enrolled

as a student at Dick's Royal Veterinary College, Clyde Street, Edinburgh. In July, 1882, he obtained the degree of Member of the Royal College of Veterinary Surgeons and returned to America.

Dr. Pierce served as Veterinary Surgeon with the Fifth Cavalry of the United States Army, from 1884 to 1889, and saw some strenuous service on the Western frontier. He is well remembered by some of the older members of the profession as having been the first American veterinarian to go across the Atlantic with a consignment of horses for the British Government. Upon his return he was besieged with inquiries from his colleagues as to the advisability of making similar trips. His invariable reply was: "If you can in any way arrange your affairs so that you can make the trip, surely do so." Those who took Dr. Pierce's advice have never regretted it.

Since 1891 Dr. Pierce has been in practice at Springfield. He is a splendid example of the type of veterinarian who has made our profession what it is today. When Dr. Ferneyhough, at the meeting in St. Louis last summer, characterized the private practitioner as the salt of our profession, he had such men as Ben Pierce in mind, and in presenting his photograph in this issue we are following up the suggestion made at that time in this regard. It is much more pleasant to say a good word for a deserving member, while he is here to enjoy it, than to "say it with flowers."

THE 1922 PROCEEDINGS

In this issue we publish the final installment of the proceedings of the meeting held in St. Louis, last year. The papers read at that meeting, and since published in our JOURNAL, have occupied approximately 350 printed pages. The business transactions and committee reports have taken up about 285 pages, a total of 635 pages, or almost equivalent to five full issues of the JOURNAL.

It is to be hoped that our members fully appreciate the value of these proceedings. In them are to be found a number of very valuable papers, prepared and presented by experts in their various fields. These papers in many cases contain information and data not available elsewhere. Frequently we have requests for copies of these papers many years after they have been read. It will pay you to preserve them.

NOMINA ANATOMICA VETERINARIA

Under the above title the report of the Committee on Revision of Veterinary Anatomical Nomenclature has been published. We can call attention to this splendid work in no better way than by quoting the introduction to the report.

"No one who is aware of the facts will deny that veterinary anatomical terminology is still in a chaotic state in this country. There are more than 15,000 names in more or less common use to designate about 5,000 structures. This multiplicity of terms is due largely to the ignorance and carelessness of non-anatomical writers and translators of foreign works.

"Recognising the seriousness of the situation, the American Veterinary Medical Association, at the Toronto meeting in 1911, voted the appointment of a Committee on Revision of Veterinary Anatomical Nomenclature. The lists of names contained in this pamphlet are the results of the labors of the original committee and its successors.

"In order to remove a rather common misapprehension it should be said that this is not a 'new' nomenclature. The number of new names in it is so small as to be practically negligible. On the other hand the revision has been carried on in consistent adherence to the principle of eliminating the great mass of synonyms under which the science of Anatomy is staggering.

"The intrinsic merits of any scientific nomenclature properly determine how quickly and generally it is adopted. The necessary qualities are precision, logical coherence, and utility. It should be accorded fair trial by those to whom it is recommended by the anatomical workers of our profession, after long and conscientious effort; it should not be permitted to fail because of prejudice and inertia on the part of others. The cooperation of teachers, writers and workers in other branches is essential if students and the younger members of the profession in particular are to be relieved of the present serious and unnecessary burden of confusing synonyms and obsolete anatomical names. It should be definitely agreed that the terminology in any branch of science shall be determined by those competent in that field."

This report should be the hands of every teacher of veterinary anatomy the world over. Members of examining boards would do well to have a copy at hand, whenever conducting examinations. How to procure copies of the report will be announced later.

THE CANADIAN NATIONAL EXHIBITION

World's fairs of the past, in London, Paris, Chicago, San Francisco and elsewhere, have each marked an epoch in the history of a nation. These giant growths, on which money, genius and enthusiasm were lavished, are now but memories to the cities which housed them and to the myriads who saw them. They were the flowering of a season.

The Canadian National Exhibition, Toronto, which many of the delegates will visit on their way home from the Montreal convention, is a world's fair of another kind, a permanent growth, deeply rooted, ever expanding. It outrivals anything the world over, as an annual event, and all preconceived ideas of its character and multitudinous attractions must fall far short of the reality. To visit the Exhibition is the only way one can obtain an adequate impression of its magnitude and its many-sided appeal.

It is difficult to define concisely the functions and work of this unique institution. Its scope is as boundless almost as the category of human effort. It has common sense and the competitive spirit at its root and is something stable and enduring, a permanent institution now in its 45th year, increasing in size and influence with the prosperity and growth of Canada, annually recurring as much expected as the seasons.

Located on the curving shores of Lake Ontario, along which it extends for one mile, almost in the heart of the city, the Canadian National Exhibition forms a most picturesque background for all the shifting scenes of a nation's work and play, and withal the suggestion of home is here in its restful paths and shady retreats. It has achieved a peculiarly distinctive place in the scheme of Canadian life and is quite unlike any other annual fair or exhibition on this or any other continent standing alone, incomparable at the very apex of Exposition achievement.

No other enterprise of a permanent character yet devised anywhere has met so many wholesome tastes and interests of the general public or has been a more complete expression of the spirit of progress in its particular country.

Last year's attendance of 1,372,500 people came from all parts of the continent and from Overseas. The daily average for thirteen days was 106,000, the total being double that of any of the State Fairs, in the United States and a record unsurpassed

by any world's fair of the past in the same number of consecutive days.

Even in its recreational features the C. N. E. keeps the educational motive in view. Always there is found something to suit every wholesome taste; in fact, in the matter of special attractions the annual World's Fair has a field all its own. The plant consists of 300 acres of beautiful park land and over 80 buildings, representing an investment of \$11,000,000. It is owned and controlled by the City of Toronto. Profits, if any, go to the city to help reduce the tax rate.

Nowhere does any nation so concentrate itself as at the C. N. E. It is the national show window. For a true and complete impression of Canada, her capabilities, her resources and her people, a visit to the Canadian National Exhibition is recommended. The estimated attendance for 1923 is 1,500,000 people.

MONTREAL HOTELS

MOUNT ROYAL—(Official headquarters) 1050 rooms, (European plan) \$3.00 per day up.

WINDSOR—700 rooms, (European plan) \$3.00 per day up.

RIT-CARLTON—240 rooms, (European plan) \$4.00 per day up.

QUEEN'S HOTEL—300 rooms, (Eur. and Amer. plan) \$4.50 per day up.

ST. LAWRENCE HALL—200 rooms, (American plan) \$4.00 per day up.

SCHEDULE OF SPECIAL TRAIN TO MONTREAL

Lv. Chicago	8:00 a. m. C. T. Saturday, August 25th, Wabash R. R.				
Ar. Windsor	4:00 p. m. E. T.	"	"	"	"
Lv. Detroit	4:00 p. m. E. T.	"	"	"	Mich. Cent. Sta.
Ar. Windsor	4:10 p. m. E. T.	"	"	"	"
Lv. Windsor	4:30 p. m. E. T.	"	"	"	Can. Pac. Ry.
Ar. Kingston	4:30 a. m. E. T. Sunday	"	26th,	"	"
Lv. Kingston					
(Swifts Wharf)	4:30 a. m. E. T.	"	"	"	Can. Stmsh. Lines
Ar. Montreal					
(Victoria Pier)	5:15 p. m. E. T.	"	"	"	"

FARES

Chicago to Montreal and return	\$44.71
Detroit to Montreal and return	\$29.95

SLEEPING CAR FARES

From	To	Lower	Upper	Section	Drwg. Rm.
Chicago	Kingston	\$7.50	\$6.00	\$13.50	\$27.00
Detroit	Kingston	4.50	3.60	8.10	16.50
Montreal	Detroit	6.60	5.30	11.90	23.10
Montreal	Chicago	9.90	7.95	17.85	34.65

SIDE TRIPS FROM MONTREAL

An opportunity will be given to inspect the new White Star Liner REGINA on Thursday, August 30th. The dock is about a fifteen-minute ride from the Mount Royal Hotel. The S. S. REGINA is 601 feet long, 68 feet broad and is rated at 16,500 tons. Those who wish to travel on the S. S. REGINA from Montreal to Quebec, Saturday, September 1st, can arrange passage. (Rate \$10.10, including luncheon.)

A very fine trip would be to go to Quebec Saturday, on the S. S. REGINA, spend Saturday night at the Chateau Frontenac built upon Dufferin Terrace, 200 feet above the St. Lawrence. On Sunday take an automobile ride through the City of Quebec; over the famous Quebec Bridge, 3200 feet in length and 150 feet above the water; to Cape Rouge; the shrine of Saint Anne d Beaupre, always the Mecca of pilgrims; and Montmorency Falls, which are higher than Niagara Falls; leaving Quebec by new Steamer RICHELIEU, Sunday night, reaching Montreal Monday morning, September 3rd. (Rate \$32.00, including all expenses, from luncheon Saturday to breakfast Monday.)

ALUMNI ASSOCIATIONS

It would be well for the secretaries of college alumni associations to make reservations early for the meetings to be held on Tuesday evening, August 28th. Communicate with the Secretary of the Local Committee, Dr. J. H. Villeneuve, 200 West Dorchester Street, Montreal, giving him the approximate number you expect to have at your meeting.

AN ERROR CORRECTED

Like the reported death of Mark Twain, the report of the death of Dr. I. I. Schmidt, of Kolding, Denmark, seems to have been very badly exaggerated. The Dr. Schmidt who died was a colleague of Dr. Schmidt of milk-fever-treatment fame, and lived in a place called Aabenraa, some 50 or 60 miles south of Kolding. A letter recently received from Dr. H. Jensen, of Kansas City, stated that he had had the extreme pleasure of meeting Dr. I. I. Schmidt, while in Denmark recently, and that the old gentleman is still hale and hearty. In which news we all rejoice.

We Want 5000 Members This Year.

DANISH VETERINARY COLLEGE CELEBRATES

Through the kindness of Dr. H. Jensen, of Kansas City, lately returned from a European tour of more than six months, we were advised that the Danish Veterinary College, of Copenhagen, would celebrate their 150th anniversary on July 13, 1923. We were directed by President Welch to send a cablegram, in the name of the American Veterinary Medical Association, communicating our felicitations upon the happy occasion. The message was sent to Dr. B. Bang, of Copenhagen.

DR. RUTHERFORD PASSES

Just as the forms for this issue were being closed word was received of the death of Dr. J. G. Rutherford, formerly Veterinary Director-General of Canada, and an ex-President of the American Veterinary Medical Association. Dr. Rutherford has been in poor health for some time, a sufferer from cardiac asthma. He went to the Pacific coast, upon the advice of his physician, early last spring, and for a time appeared to improve. He gradually became worse, however, and arrived in Ottawa about the middle of July, in a very grave condition. Death occurred on the morning of July 24.

COMING VETERINARY MEETINGS

Northwestern Ohio Veterinary Medical Association. Russell's Point, Ohio. August 1-2, 1923. Dr. C. A. Fast, Secretary, Van Wert, Ohio.

Washington State Veterinary Medical Association. (Joint meeting with British Columbia Veterinary Association.) Portland, Ore. August 2-3-4, 1923. Dr. Carl Cozier, Secretary, 320 Prospect St., Bellingham, Wash.

Wisconsin Veterinary Medical Association and Central Wisconsin Veterinary Medical Association. Stevens Point, Wis. August 8-9, 1923. Dr. O. H. Eliason, Secretary, 226 W. Gilman St., Madison, Wis.

American Veterinary Medical Association. Mount Royal Hotel, Montreal, Canada. August 27-28-29-30-31, 1923. Dr. H. Preston Hoskins, Secretary, 735 Book Bldg., Detroit, Mich.

Mahoning Valley Veterinary Club. Brookville, Pa. Sept. 13, 1923. C. M. Christy, Secretary, Brookville, Pa.

THE PATHOLOGY OF STERILITY IN CATTLE

By W. L. BOYD

University of Minnesota, St. Paul, Minn.

In presenting the subject on sterility in cattle I wish to say that the discussion this morning will be limited to those changes which occur in the reproductive organs of the female. We are not going to discuss any of the changes occurring in the male. I feel that with these slides I may be able to present to you some of the changes that commonly occur in sterility in connection with contagious abortion. There are a few other slides that will show lesions which do not occur in connection with this infection.

During the past ten years we have been studying abortion disease, and one of the projects, or sub-projects, to which we have been paying considerable attention is the pathology of sterility. Now there are many changes that undoubtedly occur in connection with this disease which we have not yet encountered, many that we have failed to recognize perhaps; and so the study of sterility or the pathology of the disease merits further study. We intend to keep up our investigations along these lines, and some of the other Experiment Stations are doing similar work.

Slide No. 1. The first slide shows the normal reproductive organs of the cow. I would like to say, just as a preliminary remark to some of the work that is to follow tomorrow, that the organs in the cow can, with a little experience and care, be readily palpated. So many of the men in the beginning of the work feel that it is almost an impossibility to palpate the various genital organs, and they frequently make the mistake of introducing the hand and arm too far beyond the rectum, into the colon, passing over these organs entirely, and then are very much surprised to find them so near and often times partially within the pelvic cavity.

Again, one will find large cows, with a great deal of length between the hook- and pin-bones, in which the reproductive organs are more difficult to palpate, especially without the use of forceps.

We find an ovary at this location and another one at this

¹Presented at the fifty-ninth annual meeting of the American Veterinary Medical Association, St. Louis, Mo., August 28 to September 1, 1922.

point; there is a slight elevation here which indicates the presence of a corpus luteum. (Fig. 1.)

Slide No. 2. This photograph is not colored, but it shows quite well the position of the bladder. Here is the cervix and the

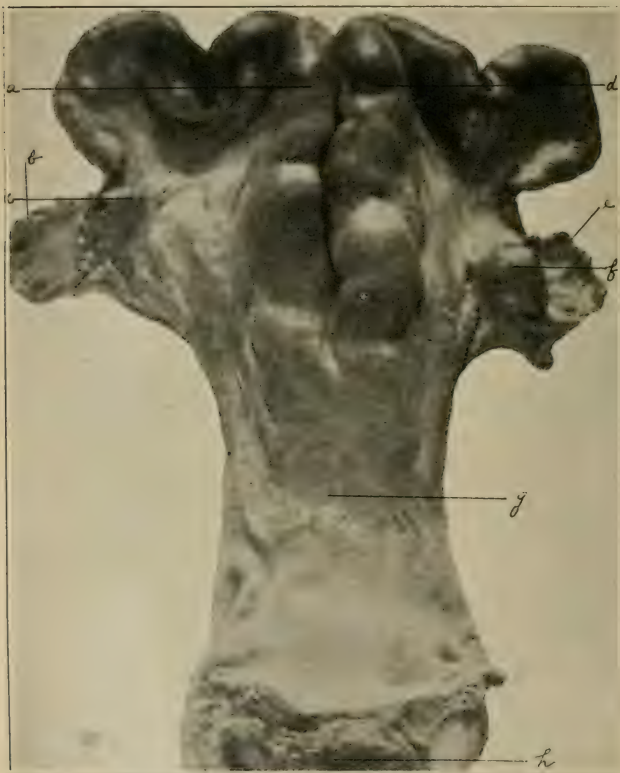


Fig. 1. Normal reproductive organs of the cow.

body of the uterus and the horns. One ovary here and another one at this point; it shows also the broad ligament.

I would like to say that ovaries differ in size considerably and yet regularly perform their normal function—that is, we may

find an ovary not any larger than an almond, with the husk off, and again one will find one as large as a green walnut, both of which are capable of normal ovulation.

Slide No. 3. This slide shows the cervical canal. A great many of the pathologic changes that one meets in the treatment of sterility occur at this point. In the vagina you will remember the epithelium is so arranged that bacteria have little opportunity to cause many pathologic changes. We find that the cervical canal is not a straight passage, and in the longitudinal folds of the mucosa the bacteria can become hidden and covered with mucus, which protects them from various medicinal agents with which you may attempt to remedy the condition.



Fig. 2. Longitudinal section of the uterine cervix. Note spiral-shaped canal and folds of the mucosa.

The cervix, on account of its anatomical structure, when once affected with inflammatory changes, provides the bacteria with such protection that they are very difficult to reach with any sort of treatment.

Slide No. 4. This represents the cervix after it has been removed and hardened in formalin. In the cow the cervix is about three to four inches in length, the lumen (cervical canal) of which is rather tortuous and difficult to dilate. The organ feels very hard, because of the great amount of muscle and fibrous tissue, so that a great many of us, in examining a cow's cervix for the first time, may make up our mind that the cervix

is too hard and say that it is hardened, that it seems to be, perhaps, in a state of chronic inflammation, but in most cases that hardness is not due to fibrosis as a result of inflammation, but is normal.

Here we find the opening of the canal, and if you will follow along closely you can see the arrangement of the mucosa. Up here you can see it extending out into the lumen, and in case of the bacteria being in these recesses, they are covered over with mucus, and, therefore, cervicitis becomes a rather difficult condition to medicate, and many times it is of long standing, bringing



Fig. 3. Severe cervicitis. Cervix and portion of vagina are prolapsed.

about hypertrophy of the lips of the external os and produces more or less desquamation of the epithelium. (Fig. 2.)

Slide No. 5. In some cases of cervicitis there is a great relaxation of the ligaments and part of the vagina prolapses, the cervix becomes protruded and in this case (Fig. 3) we see the vagina along here, and down here the outer part of the cervix or the external lips, and at this point you can see the nature of the discharge. I would like to say that in cervicitis the discharge sometimes is rather thin, mucus-like, containing particles of catarrhal discharge. Again, this discharge may be thick, and so adhesive

that one may readily confuse it with a normal, mucus plug of pregnancy. If we depend only upon the presence of a mucus plug in determining a diagnosis of pregnancy, we may readily make a mistake in our diagnosis.

Slide No. 6. This is another view which shows the cervix very clearly. It is very much engorged with blood, that is, it is hyperemic and hypertrophied. The vagina is partially prolapsed.

Slide No. 7. This ovary shows the presence of a corpus luteum. This corpus luteum is markedly projected above the surface,

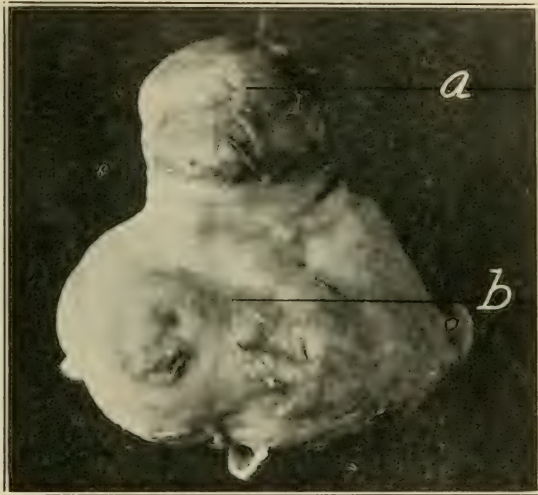


Fig. 4. Ovary showing presence of corpus luteum. Note distance the corpus luteum projects above the surface of ovary.

being only slightly imbedded; and it would be rather easily enucleated. Its lower border is about at this point.

I will say that in almost every cow, whether she be pregnant or non-pregnant, whether she be sterile, either temporarily or permanently, we invariably find a corpus luteum in some stage of development, whether it be normal or pathologic. In this case it is one of those that is situated very near the surface. (Fig. 4.)

Slide No. 8. Here we see the corpus luteum after it has been removed. In many cases the corpus luteum is about the size of a cherry; again we may find it, where it is undergoing degenerative

changes, to be much smaller. There is always an opening or a wound produced when the yellow body is enucleated. The corpus luteum is surrounded by a network of capillaries and when it is removed there is always more or less hemorrhage. The corpus luteum is a gland of internal secretion, and its function is fairly well understood.

The retention of the corpus luteum following parturition is frequently responsible for the absence of estrum, and an animal may be fresh for several months and not show estrum but when the corpus luteum is removed it allows ovulation to take place again. In a great many cases in which we have collected data,

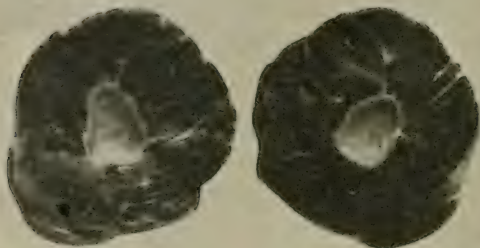


Fig. 5. Corpus luteum, cut transversely, showing the beginning of cyst formation.

the ovary from which the corpus luteum is removed is not the one that usually functions first, but the other ovary liberates an egg, perhaps in three to five days. That means if there are no other extensive pathologic changes present, estrum will appear within a few days after removal of the corpus luteum. We have followed up quite a large number of cases, checking up to see why and in what manner the corpus luteum was interfering with ovulation. You can figure out how it would interfere here perhaps, by mechanically obstructing the maturation of the eggs; we think also, that the corpus luteum, by means of internal secretion, inhibits ovulation in the opposite ovary.

Slide No. 9. The retained corpus luteum is subject to various degenerative changes. One is fibrous, but the most common is

cystic, so that ovarian cysts have different points of origin. One is from the graafian follicle, and another is from the corpus luteum. Many times practitioners will tell you that they have attempted to remove a corpus luteum and have found that it seemed to break, somewhat like a cyst, yet they could feel a part of the gland still imbedded. Here we see the beginning of the cyst and after a while all of these cells will have become cystic and then one could not tell it grossly, of course, from a cyst which originated in a graafian follicle. (Fig. 5.)

Slide No. 10. Here is a slide that shows a corpus luteum that is rather deeply imbedded; the wall around it is rather heavy. This photograph is not colored, but it shows the corpus luteum very well. There was another one removed at this point. At the time of the operation we did not realize that two corpora lutea were present.

Slide No. 11. Here we have a large ovarian cyst, associated with hydrosalpinx and rather marked adhesions. Cystic ovaries are rather common pathologic conditions in sterility, probably originating most frequently from the graafian follicles. Again they may originate from corpora lutea, and sometimes we find cystic ovaries that perhaps may have had no connection, in so far as we have been able to determine, to infectious abortion, but in many cases they do seem to be quite prevalent in herds where infectious abortion is or has been present.

We believe that perhaps cystic degeneration is one of the most common pathologic conditions in sterility, and I would like to say that the symptomatology is quite characteristic, that cows affected with cystic changes of the ovaries usually show irregular estrum, and sometimes they develop nymphomania, commonly spoken of as "bullers", and it is not safe to turn them loose with the rest of the herd. Because of certain changes in their conformation, particularly in the region of the rump and tail-head, the bones are so affected that they are rather easily fractured, in case of falling or being ridden by other animals.

Those are the symptoms that we find in cystic degeneration of the ovary. Occasionally you will find irregular estrum where a cow is showing disturbances of the heat period, but on examination you will be unable to find any evidence of cystic formation, but the probabilities are that cystic changes are present, but too small to detect by palpation.

Slide No. 12. In extensive hydrosalpinx, in which the lining

of the oviduct has been entirely destroyed, the walls of the tube become very thin and the lumen is filled with a clear, water-like fluid. Of course, in those cases, we have a sterile animal, especially if both tubes are involved. I believe they follow pus formation in almost all cases, with desquamation of the epithelium and a straightening out of the canal and thinning of the wall, so that hydrosalpinx often follows salpingitis, in which there has been pus formation.

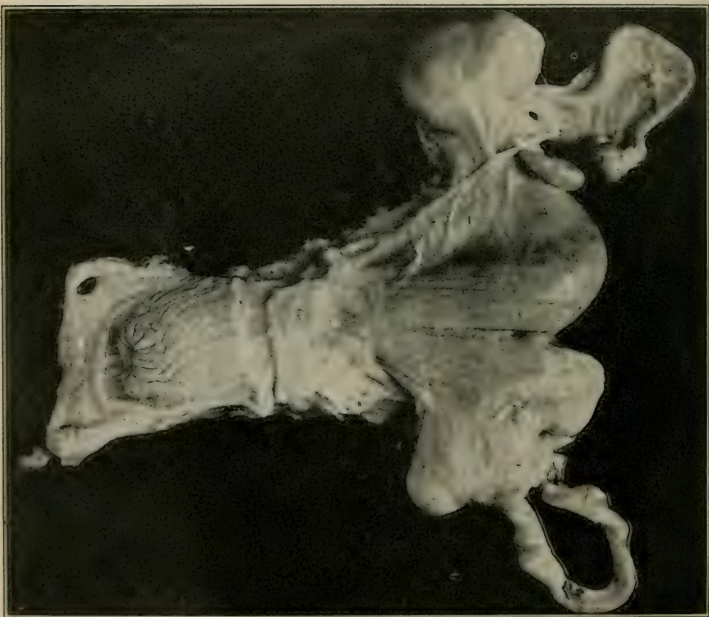


Fig. 6. Reproductive organs of cow which suffered with nymphomania.

As far as the bacteriology in our work is concerned, *Bacterium abortus* (Bang) is not responsible for many of the extensive changes, other than acting as a means of paving the way for the entrance of other bacteria, such as perhaps *Bacillus pyogenes*, streptococci and other organisms of the pus-forming group. We have tried to infect normal animals by introducing, into the cervical canal and uterus, *Bacillus pyogenes* in large cultures, and



Fig. 7. Change in conformation resulting from cystic degeneration of the ovaries. Note shape of rump, particularly the tail-head.

so far we have been unable to affect the reproductive organs of a normal animal with this organism, but only occasional cases have been found where there was pus formation from which we were not able to isolate *Bacillus pyogenes*.

Slide No. 13. This animal shows the changes that I spoke about in this region, in connection with cystic ovaries. She suffered a fall, and a fracture resulted.

Slide No. 14. This shows the condition of her reproductive organs; you see here the opening of the cervix and up here the right and left horns. If we look over here, we notice that the left ovary is adherent to the uterus; the oviduct is enlarged and is in a state of hydrosalpinx; the same is true over here, this ovary is greatly enlarged and cystic. (Fig. 6.)

Invariably, in cows with these changes in the region of the tail-head, one will find cystic changes of the ovaries.

Slide No. 15. This slide shows the fracture of the vertebrae. The bones seem to be more brittle, and if you push the affected cow over suddenly in the stall you can hear a peculiar sound indicating looseness of the articulations, and if she is out in the pasture and is ridden by other animals or happens to fall, you will find that the bones in the region of the pelvis will fracture rather easily.

Slide No. 16. Here is another slide that depicts this condition rather clearly. This cow was a show animal, with excellent conformation, but after suffering with cystic degeneration of the ovaries, she hollowed out here, due to the relaxation of the ligaments, and we had a permanently sterile cow as a result of extensive cystic formation of both the oviduct and the ovary. (Fig. 7.)

Slide No. 17. Here is another case, perhaps not so extensively affected. This animal was secured early after she developed the symptoms, and in one or two treatments she returned to a normal condition again.

Cystic changes of the ovary are at times rapid in development, but regeneration is almost equally as rapid.

Slide No. 18. Here is another slide showing this condition very well. Cystic changes of the ovaries sometimes stimulates butter-fat production. In this particular case she was treated for cystic ovaries, and got with calf, and at the termination of pregnancy put on an official test, which she has just completed.

Immediately after freshening she developed cystic changes in both ovaries, but was not treated, and yet she has established a new state record for the Jersey breed. In this cow the production of milk and butter-fat was apparently stimulated by disturbances of the ovaries. (Fig. 8.)

Slide No. 19. This is a close-up view showing the condition due to the relaxation of these ligaments and the raising of the tail-head.

Slide No. 20. This is another view of the same condition. You will notice the extreme height at the tail-head. At one time this animal was level across the top-line.



Fig. 8. The results of cystic changes of the ovaries.

Slide No. 21. In the oviduct we find a great many different sorts of changes. Sometimes the condition is due to an accumulation of water or hydrosalpinx. In this case we find the tube greatly enlarged and filled with pus, and at this point the pus is caseated and the tube is completely obstructed. Up here we find a cross section of a normal tube and here you can compare it with those sections which are diseased.

In this case there was a great thickening of the walls of the oviduct, and later on I will have a slide to show you what caused it.

Slide No. 22. Here is a case that shows some changes that may occur after the removal of a corpus luteum, where there may be infection in the ovary. Diseased ovaries may at times contain bacteria. Our bacteriologic examinations of cystic ovaries, at time of slaughter, as a rule show them to be sterile, but sometimes they do contain bacteria. So, if a corpus luteum is removed, or a cyst broken down, in which there are bacteria present, a rather extensive inflammation occurs and the pathologic conditions become more extensive and severe than they were before the cyst was ruptured or the corpus luteum removed.

Slide No. 23. This slide represents a fairly common pathologic condition in sterility. It was photographed in such a position that it doesn't show well here, but it is known as pyometra. Pyometra is a rather common condition in sterility and almost all of the cases that we have examined have shown the presence of *Bacillus pyogenes*.

In pyometra the mucosa becomes almost entirely destroyed; the epithelial cells will become desquamated and other types of epithelium will replace them; but if treatment is given early, the uterus may come back to its normal size and the animal may again reproduce. If they are treated late in life, sometimes they keep on refilling with pus and never become normal; again the uterus will apparently become normal in size and in position, the cow show her normal estral periods and be bred numbers of times and yet never conceive. Because of the destruction of the epithelium, apparently there is no place for the fertilized egg to become imbedded. So, in cases of pyometra of long standing, there is a great deal of destruction which never seems to be properly repaired, or the epithelium that takes the place of the normal tissue is such that it does not permit the fertilized egg to become successfully imbedded.

Slide No. 24. Here is a uterus showing the collection of a large amount of pus. In these cases of pyometra the history is sometimes confusing. A man making a rectal examination may think that the animal in question is pregnant, but if he will examine the cervix he will find it is usually partially open, and when the cow is in a recumbent position, there is more or less escape of a white or yellowish-white pus; sometimes it is malodorous and sometimes

not. There is an absence of estrum usually, but when the uterus is examined, we find that the walls do not have the same amount of muscle tone. And usually in one or the other of the ovaries there will be a corpus luteum present, which is frequently deeply situated. (Fig. 9.)

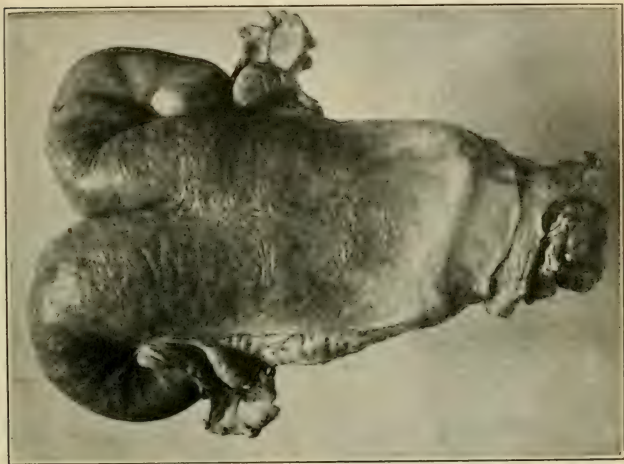


Fig. 9. Pyometra somewhat resembling the gravid organ.

Slide No. 25. This slide shows pretty well the longitudinal muscular folds of the horns of the uterus. They are not always so well marked as this.

Here we find the oviduct filled with an amber-colored fluid. In this ovary there is a corpus luteum present.

Slide No. 26. This slide is similar. We will pass right on to the next one.

Slide No. 27. There are pathologic conditions undoubtedly occurring in animals which we are unable to detect upon manual examination. Here is a case, apparently normal, that never would breed; and securing these organs after slaughter and studying them histo-pathologically, we found that the mucous lining was rather swollen and contained a gelatinous or watery-like fluid found in mucoid degeneration. In this case it was so

extensive that conception was impossible, but we did not recognize that until we conducted the autopsy.

Slide No. 28. This slide is somewhat dark, but we can see the outline of the ovaries on both sides; both contained an organized clot of blood. Ovarian hematomata are not very common.

Slide No. 29. Sometimes the uterus undergoes a condition of cystic formation known as hydrometra. These cysts occur in the uterine glands, probably due to bacterial invasion. On manual examination sometimes we fail to find these cysts, unless some of them are quite large, but we can see the lining

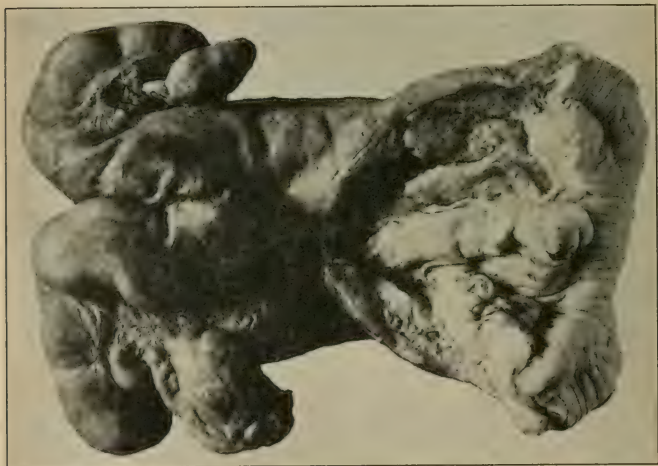


Fig. 10. Endometritis, cystic ovary and oviduct. Extensive adhesions between ovary and oviduct.

here and we can see these little openings all through it—multiple cystic formation—and these cysts are all present in the uterine glands.

Slide No. 30. Here we find the vagina and the cervix laid open, and the left horn and the right horn. Here we see a rather common pathologic condition. If the ovary has been badly diseased, very frequently the oviduct is affected with hydrosalpinx and is adherent to the ovary. Adhesions are very common pathologic conditions in sterility. (Fig. 10.)

Slide No. 31. Another condition that we frequently meet

with—perhaps not always connected with abortion disease—is where there is mummification of the fetus. Mummification of the fetus means some destruction of the uterine mucosa; it means also a retained corpus luteum, and this corpus luteum sometimes becomes rather deeply imbedded, making it rather difficult of removal, but many of these cows that have been treated for this



Fig. 11. Maldeveloped genital organs.

sort of condition—mummification of the fetus—have been restored to normal breeding condition, because the destruction of the epithelium was not extensive.

Slide No. 32. Here is a section of the uterus showing the mucous surface which presents a nodular formation. At first, upon examination, it was thought to be tuberculous, but a microscopic study showed it to be vegetative endometritis. Macroscopically it resembles tuberculosis.

Slide No. 33. Here is a slide that is rather interesting. In many cases of severe infections following retention of the fetal membranes, there will be abscess formation with adhesions. Here is a large abscess, and another one at this point and another abscess up here. Abscess formation is not uncommon in cases of metropéritonitis, with rather marked and extensive adhesions. Many of these cases are rendered permanently sterile.

Slide No. 34. In connection with the pathologic changes not brought about by bacteria, we find that quite a number of heifers which have not suffered with abortion disease are sterile for some reason or other; many of these are sterile because of malformation of the organs. In many of these cases of malformation we have found that the owner had been practicing rather



FIG. 12. Rudimentary uterus and ovaries from heifer 2½ years of age. Note shape and longitudinal furrows of the ovaries.

close breeding, and that there was one or more parts of the reproductive organs missing.

Here we have a slide that shows what is supposed to be a horn of the uterus; the ovary here, over here the other ovary and here another horn of the uterus. In this little strip of tissue was a milky-like fluid representing some form of degeneration. No

bacteria were present. Similar conditions are found quite frequently in the study of the pathology of sterility.

Slide No. 35. Another condition with which you are all familiar, undoubtedly, is that found in the free-martin or the heifer calf that is twinned with a male animal.

Slide No. 36. Another malformation. Here we find the vagina laid back and the opening of the cervix and the body of the uterus. There was a connection here, all the way through, but there was no connection here, just a strip of connective tissue and no canal. We found a milky fluid, which was sterile, no



Fig. 13. Hydrometra. Note dilated glands.

bacteria being present. This sort of a condition in our experience invariably has been found in those herds where they have been practicing close breeding. Thus it is well to consider, in the study of sterility, malformation of the organs. (Fig. 11.)

Slide No. 37. This slide shows a rudimentary uterus, which is fairly common, and rudimentary ovaries in which there was plenty of connective tissue but no ovisacs near the surface. Small graafian follicles appear in the central portion. (Fig. 12.)

Slide No. 38. This is a microscopic section. Here we find the lymphoid bodies; and here we find a large gland which has

become cystic. These glands probably become cystic through infection, and here we find normal glands. In the lumen of the gland will be found leukocytes, broken-down cells and a gelatinous-like fluid. (Fig 13.)

Slide No. 39. This slide shows more or less fibrous formation, and here we find the cellular elements.

Slide No. 40. Another slide showing cystic formation of the uterus.



Fig. 14. Uterus affected with leukemia.

Slide No. 41. This slide does not show very much at all, because in mucoid degeneration the tissue is rather difficult to stain.

Slide No. 42. This slide represents a section through an oviduct. We thought the thickening was due to fibrosis, but on microscopic study we found that the epithelium had become removed or desquamated and that a round-cell infiltration was responsible for the thickened walls.

Slide No. 43. Here in this slide we find the cervix, the body of the uterus, and here is one of the horns. Over here is the other horn of the uterus, and the broad ligament at this point.

Here is a rather large ovary, weighing something like thirty-six to forty pounds—a tumor.

Slide No. 44. This shows a large fibroma removed from the vagina of a cow.

Slide No. 45. In this last slide we have a very rare, at least I think very rare, pathologic condition in sterility. We frequently find and hear of leukemia in the cow, but in so far as I know there has been no case of leukemia described, in which the reproductive organs were involved, although I haven't looked up the literature very carefully. (Fig. 14.)

In this case the uterus was affected and you can see how thick the walls are.

Here also it gives us an idea of the thickness of the walls and the length of the horns, absolutely no signs of an inflammatory condition, but there was extensive thickening, due to the infiltration of lymphoid cells.

IMPORTANT CHANGES IN BUREAU OFFICIALS

Dr. H. M. Graefe (K. C. V. C. '09), who has been in charge of Bureau field activities in Kansas, has been transferred to a field assignment in Nebraska.

Dr. N. L. Townsend (U. P. '99), for a number of years in charge of Federal Meat Inspection project at New York City, has been transferred to Topeka, Kansas, where he will have charge of scabies and tuberculosis eradication, as well as hog cholera control.

Dr. E. C. Joss (Chi. '02), inspector-in-charge of Federal Meat Inspection at Portland, Oregon, has succeeded Dr. N. L. Townsend as inspector-in-charge at New York City.

Dr. M. O. Anderson (Ont. '86), for several years in charge of Federal Meat Inspection at South St. Paul, Minnesota, has been transferred to a similar assignment at Portland, Oregon.

Dr. R. M. Mullings (N. Y. C. V. S. '89), inspector-in-charge of Federal Meat Inspection at Jersey City, has been transferred to South St. Paul, Minnesota, to take charge of the same line of Bureau work at the latter point.

Dr. T. J. Kean (U. P. '90), traveling veterinarian in the Meat Inspection service of the Bureau of Animal Industry, has been assigned to take charge of the Meat Inspection project at Jersey City.

SOME EXPERIMENTAL WORK IN HOG CHOLERA¹

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It is not the object of this paper to advance any new features of hog cholera or its control, but rather to present the results of some work conducted to determine proper technic under certain conditions met with in field practice. Variations quite frequently occur which compel the operator to decide between two or more methods of procedure and to assist in making proper decision, in a few instances, is the object of the following experiments.

The results of any experimental work, with a disease such as hog cholera, must be interpreted broadly, due to the great number of conditions which would influence similar work conducted in field practice. The results obtained, as set forth in the following experiments, should be regarded as applying to instances where ideal conditions prevail, but would possibly vary somewhat under less favorable conditions. The following is submitted to you in the hope that it may be of some assistance in solving your field problems.

EXPERIMENT NO. 1

Object of Experiment:—To determine the effect, if any, upon the potency of anti-hog cholera serum when subjected to freezing.

Explanation:—Frequently, through conditions which perhaps are mostly avoidable, but nevertheless quite common, serum is frozen to different degrees for varying lengths of time. Whether or not this condition would have any effect upon the potency of the material would perhaps be a question in the minds of some and as a field test is not practical, the following experiment was conducted.

Description:—In this experiment serum of known potency was used, which in the original test had protected 50-lb. pigs in doses of 10 cc against 2 cc of virus. Samples of this serum were kept frozen for periods of three, seven and fourteen days, respectively. They were then thawed at room temperature and tested in doses of 10 cc and 20 cc on pigs averaging 49 lbs. in

¹Read before the semi-annual meeting of the Michigan State Veterinary Medical Association, East Lansing, Michigan, June 27, 1923.

weight. All serum pigs remained healthy, with the control pig dying on the twelfth day, showing symptoms and post-mortem lesions of acute cholera.

Summary:—Freezing seemed to have no influence upon the potency of anti-hog cholera serum.

EXPERIMENT No. 2

Object of Experiment:—To determine the part played by birds in the transmission of cholera from one farm to another and the time required for physical evidence of cholera to appear following transmission of infection in this way.

Explanation:—It has long been recognized that birds, especially buzzards, pigeons, sparrows, etc., play an important part in the dissemination of cholera over large areas. While the possibility of this condition has not been denied, it was regarded as an important point in control to know something of the rapidity with which the disease could be spread in this manner and the time required for evidence of disease to appear in territory adjacent to an outbreak of cholera, if this was the only unguarded method of dissemination.

Description:—In this experiment ten susceptible pigs were used. These pigs were of the same litter, about ten weeks old and averaged 45 lbs. in weight. They were divided into three lots, each lot being placed in one of three adjacent pens. The pens were of solid concrete formation, with walls thirty-six inches high and had no connections. Pen No. 1, with three pigs, was used as the control pen, the pigs receiving no treatment. Pen No. 2 was used as the infection pen, with three pigs receiving an injection of virus and one control pig serum and virus. Pen No. 3, with three pigs which received no treatment, was used as the exposure pen. Pens Nos. 2 and 3 were enclosed together, with fine-mesh, wire screening which would exclude mice and sparrows. Attendants entered only the infection pen and for the purpose of taking temperatures. Observations were taken daily, temperatures of the pigs in the infection pen being recorded and the other pigs observed for physical evidence of disease. Transmission was accomplished by six White Leghorn hens that had access to pens Nos. 2 and 3.

All feeding and watering was done from the outside of the pens, the feed consisting of a thin slop, fed in shallow troughs, and shelled corn fed on the floor. Manure was not removed during the test. Control pen was fed in the usual manner. The

infection pen was fed and the chickens would mingle with the pigs to get a share of the feed. Fifteen minutes later, the exposure pen was fed and the chickens would fly over the partition and feed among the exposed pigs.

All pigs in the control pen, and the serum pig in the infection pen, remained healthy during the test. The virus pigs in the infection pen showed an elevation of temperature on the fourth day, with loss of appetite and other physical evidence of infection from the eighth to the ninth day. Two died on the eleventh and one on the seventeenth day after inoculation. All of the pigs in the exposure pen developed loss of appetite on the seventeenth day of the test, or the ninth day after the appearance of physical sickness, and thirteen days after the appearance of temperature reaction in the pigs in the infection pen. Two pigs died on the second day and one on the third day, after showing physical evidence of disease. Post-mortem lesions were those of hog cholera.

Summary:—Chickens proved to be an important factor in the transmission of hog cholera, when confined to close quarters. Physical evidence of cholera appeared in the exposed pigs nine days after it appeared in the infected pigs.

It should be understood that these results were obtained under intensified conditions and a somewhat longer period of time could be expected under natural conditions. (See Table No. I)

TABLE I
CHICKENS AS CARRIERS OF THE VIRUS OF HOG CHOLERA

Pen	Pig No.	Treatment	Result
No. 1 (Control)	91	None	Remained well. Released 20th day. Susceptibility to cholera subsequently proven by inoculation with virus.
	92		
	93		
No. 2 (Infection)	94	Serum-virus	Remained well. Released 20th day.
	95	Virus	Sickened 8th day. Died 11th day.
	96		Sickened 8th day. Died 17th day.
	97		Sickened 9th day. Died 11th day.
No. 3 (Exposure)	98	Exposed	Sickened 17th day. Died 19th day.
	99		Sickened 17th day. Died 20th day.
	100		Sickened 17th day. Died 19th day.

EXPERIMENT No. 3

Object of Experiment:—To determine the comparative virulence of whole and clarified cholera blood, at different periods after carbolization.

Explanation:—Following the advent of clear anti-hog cholera serum the question of a clear hog cholera virus in the form of centrifuged hog blood was considered. The opinion was held by some workers that a clear, phenolized virus, of this nature, would not retain its virulence as long as carbolized, whole-blood virus, due to the greater bactericidal action of phenol in the blood virus from which the corpuscles had been removed. To determine definitely the relative virulence of the two products the following experiment was conducted.

Description:—Twenty-two susceptible pigs, averaging about 50 lbs. in weight, of practically the same age and raised together on the same farm, were divided into four lots, three lots of six each and one lot of four. Each lot was subdivided, half of the pigs being placed in each of two pens. Each lot received an injection of 2 cc of virus of the same collection and date of carbolization, one pen receiving whole, carbolized, virulent blood and the other centrifuged, carbolized, virulent blood. One pig in each pen received serum in addition. Virus which had been carbolized for different lengths of time was used, lot No. 1 receiving blood carbolized nine days; lot No. 2, twenty-nine days; lot No. 3, forty-nine days; and lot No. 4, sixty-eight days. Observations were made daily, temperatures and physical reactions being recorded.

All pigs receiving serum in addition to the virus remained healthy throughout the experiment. All pigs which received virus alone showed an elevation of temperature on the fourth day and loss of appetite on the fifth or sixth day. They were killed for diagnosis on the sixth day. Post-mortem findings were those of acute cholera and very uniform throughout.

Summary:—In this test there was no apparent difference in the virulence of the whole-blood virus and the clarified-blood virus, up to and including a period of sixty-eight days carbolization. Neither was there any difference in whole or clarified virus for the different periods of carbolization. (See Table No. II.)

SUPPLEMENTARY EXPERIMENT

Explanation:—The sixty-eight-day period of carbolization exceeds the age limit on virus dispensed under government super-

TABLE II
COMPARATIVE VIRULENCE OF WHOLE-BLOOD AND CLARIFIED HOG CHOLERA
VIRUS AT DIFFERENT PERIODS AFTER CARBOLIZATION

Pig No.	Virus	Treatment	Result
878 880 881	Whole-Blood (9 days)	Serum-Virus Virus Virus	Remained well Killed 6th day Killed 6th day
879 882 883	Clarified (9 days)	Serum-Virus Virus Virus	Remained well Killed 6th day Killed 6th day
872 874 875	Whole-Blood (29 days)	Serum-Virus Virus Virus	Remained well Killed 6th day Killed 6th day
873 876 877	Clarified (29 days)	Serum-Virus Virus Virus	Remained well Killed 6th day Killed 6th day
866 868 869	Whole-Blood (49 days)	Serum-Virus Virus Virus	Remained well Killed 6th day Killed 6th day
867 870 871	Clarified (49 days)	Serum-Virus Virus Virus	Remained well Killed 6th day Killed 6th day
862 864	Whole-Blood (68 days)	Serum-Virus Virus	Remained well Killed 6th day
863 865	Clarified (68 days)	Serum-Virus Virus	Remained well Killed 6th day
940 941 942	Whole-Blood (103 days)	Serum-Virus Virus Virus	Remained well Died 15th day Died 17th day
943 944 945	Clarified (103 days)	Serum-Virus Virus Virus	Remained well Died 15th day Died 11th day
946 947 948	Whole-Blood (139 days)	Serum-Virus Virus Virus	Remained well Died 15th day Died 16th day
949 950 951	Clarified (139 days)	Serum-Virus Virus Virus	Remained well Remained well* Remained well*

*Susceptibility of these two pigs proven by subsequent inoculation.

vision, but to get a further check on the resistance of the virus of hog cholera to the action of phenol, the following supplementary test was conducted.

Description:—Twelve pigs averaging 35 lbs. in weight were divided into two lots of six each. Each lot was subdivided, half of the pigs being placed in each of two pens. One lot was injected

with virus carbolized one hundred and three days, and the other with virus carbolized one hundred and thirty-nine days, the pigs in one pen receiving whole-blood virus and those in the other clarified virus of the same collection and date of carbolization. One pig in each pen received serum in addition. Observations were made daily, temperatures and physical reactions being recorded.

The serum pigs remained healthy throughout the test. The virus pigs injected with whole-blood virus, carbolized one hundred and three days, showed an elevation of temperature on the fourth day and loss of appetite on the fifth day. The disease was allowed to run its course, one pig dying on the fifteenth and one on the seventeenth day. The virus pigs injected with clarified virus, carbolized one hundred and three days, showed an elevation of temperature on the fourth day and loss of appetite on the seventh day. One died on the eleventh and one on the fifteenth day.

The virus pigs injected with whole-blood virus, carbolized one hundred and thirty-nine days, showed an elevation of temperature on the fourth day and loss of appetite on the fifth day. One died on the fifteenth and one on the sixteenth day. The virus pigs injected with clarified virus, carbolized one hundred and thirty-nine days, remained healthy. Their susceptibility to cholera was proven by subsequent inoculation.

Summary:—Carbolization for one hundred and three days seems to have no effect on the virulence of either whole-blood virus or clarified virus. Carbolization for one hundred and thirty-nine days did not destroy the virulence of whole-blood virus, but clarified virus, carbolized one hundred and thirty-nine days, did not infect susceptible pigs. (See Table No. II).

The principal argument advanced against the efficiency of clarified virus is that the period of immunity which follows its use, in the serum-virus method of immunization, is of shorter duration than that produced by the use of whole-blood virus. Perhaps the most rigid test of immunity that could be made would be the hyperimmunization of supposedly immune hogs by an intravenous injection of a large amount of virulent cholera blood. Using this method, the immunity of two hundred and twelve hogs, which had been immunized for different lengths of time, with clarified virus, was tested. These hogs had been immunized as pigs, having received a dosage of from 30 cc to 40 cc of serum and 2 cc of clarified virus. The dosage used in

immunization, the duration of time between immunization and hyperimmunization, with the results, are shown in Table No. III.

TABLE III
RESULTS OF HYPERIMMUNIZATION OF TWO HUNDRED AND TWELVE (212)
HEAD OF HOGS IMMUNIZED WITH CLEAR VIRUS

No. Hogs	Immunizing dose		Time of Immunity	Results of Hyperimmunization
	Virus	Serum		
39	2 cc	50 cc	5 mos. 7 days	Immunity perfect
30	2 cc	30 cc	5 mos. 24 days	Immunity perfect
17	2 cc	40 cc	6 mos. 2 days	Immunity perfect
16	2 cc	30 cc	6 mos. 9 days	Immunity perfect
19	2 cc	40 cc	6 mos. 22 days	Immunity perfect
26	2 cc	40 cc	7 mos. 13 days	Immunity perfect
30	2 cc	30 cc	8 mos. 14 days	Immunity perfect
35	2 cc	30 cc	8 mos. 24 days	Immunity perfect

These hogs were hyperimmunized by the intravenous injection of virulent cholera blood at the rate of 5 cc per pound body weight, which averaged about 1000 cc per hog. The most marked example of the duration of immunity would be found in the last two groups of hogs, which were from one herd and were treated when small pigs weighing 40 lbs. or less. These hogs were hyperimmunized, eight and one-half months later, and none of them developed even a temperature reaction.

EXPERIMENT No. 4

Object of Experiment:—To determine the possibility of producing active immunity, by the administration of virus at different intervals after serum-alone treatment, and incidentally to determine the duration of passive immunity, when tested by the direct injection of virus.

Explanation:—Frequently an immunity is desired under conditions which would make the administration of virus a dangerous procedure. For example, sows which are to farrow in a short time, show hogs to be shipped to fairs and stock hogs shipped for feeding purposes. Especially in the latter instance, shipping would furnish some chance for infection with cholera, making immunity desirable and at the same time the resulting exposure, together with a change of feed and other conditions, could so

lower the animals' resistance that the immediate use of virus would be inadvisable. The most universally recognized method of procedure in these instances has been the use of what is known as the "follow-up" treatment. This consists of the use of serum alone, for immediate protection, followed in three or four weeks by serum and virus under more favorable conditions. This procedure doubles the cost of immunity and it was realized that if instead of the second treatment consisting of serum and virus, an administration of virus alone could be given with relative safety, and yet establish the same degree of active immunity, the cost could be reduced practically one-half. For the purpose of establishing the degree of safety, as well as the efficiency of this method, the following experiment was conducted.

Description:—Twenty-four shotes averaging about 50 lbs. in weight were obtained from a farm where an accurate history of conditions was available. These shotes were each given an intraabdominal injection of 40 cc of clear serum. On each succeeding seventh day, thereafter, one lot of four pigs was given an injection of 2 cc of hog cholera virus, making six lots, injected a week apart. With one exception all pigs remained healthy up to and including the fifth week. All pigs receiving virus the sixth week showed an elevation of temperature on the fourth day and loss of appetite on the sixth day. They were killed for diagnosis on the eighth day and showed distinct lesions of cholera.

With the exception of one pig (No. 664) in the third week, which developed cholera after ten days and was killed as a chronic case ten weeks later, the immunity seemed to be absolute for the first five weeks, although there was a slight temperature reaction in all pigs in the fifth week. The pigs injected the sixth week, however, seemed to have no resistance to infection. This would indicate, in this instance, that the passive immunity expired between the fifth and sixth week.

To test the duration of the active immunity produced, one pig in each of the first five weeks was subjected to infection by inoculation, the fourth, fifth, sixth and seventh month after receiving virus. The immunity remained absolute in all hogs.

Summary:—When tested by direct inoculation, passive immunity protected pigs for five weeks in one instance. The active immunity produced did not vary up to and including the

seventh month, regardless of when the virus was given after serum-alone. (See Table No. IV.)

TABLE IV

TESTS OF IMMUNITY PRODUCED BY SERUM-ONLY TREATMENT, FOLLOWED BY VIRUS AT DIFFERENT INTERVALS

Pig No.	Treatment	Temperatures								Result	Tested
		1	2	3	4	5	6	7	8		
655	Serum, Dec. 28; Virus, Jan. 4	2.6	2.4	3.0	2.6	2.0	2.4	2.8	2.4	R.W.	May 4
656		2.4	2.8	2.0	3.2	3.0	3.2	3.6	3.2	R.W.	June 7
657		2.2	3.2	3.0	2.0	2.0	2.4	2.4	2.6	R.W.	July 12
658		3.0	3.0	2.2	3.0	2.6	2.6	3.0	2.8	R.W.	Aug. 15
659	Serum, Dec. 28; Virus Jan. 11	2.2	2.2	1.8	2.0	2.6	2.4	1.8	2.0	R.W.	May 4
660		2.4	2.0	2.0	2.2	2.0	1.6	2.0	1.8	R.W.	June 7
661		2.6	2.8	2.4	2.4	2.0	2.0	2.0	2.4	R.W.	July 12
662		3.4	2.8	2.8	2.6	2.6	2.8	2.4	2.2	R.W.	Aug. 15
663	Serum, Dec. 28; Virus, Jan. 18	3.2	3.0	2.6	3.0	2.2	2.6	2.0	3.2	R.W.	May 4
664		3.0	3.2	3.2	3.0	2.6	2.8	2.6	2.6	R.W.	June 7
665		2.6	2.8	2.4	2.8	2.2	1.8	2.4	2.8	R.W.	July 12
666		2.4	2.0	1.6	2.2	2.4	2.0	2.6	2.2	R.W.	Aug. 15
667	Serum, Dec. 28; Virus, Jan. 25	2.0	2.2	1.8	1.8	2.0	2.6	1.8	2.4	R.W.	May 4
668		1.8	1.6	1.4	1.8	2.6	2.4	1.6	2.2	D.I.	
669		2.0	1.0	1.6	2.0	2.0	2.2	2.4	2.0	R.W.	July 12
670		1.6	1.2	2.6	2.0	1.6	2.4	2.2	2.8	R.W.	Aug. 15
671	Serum, Dec. 28; Virus, Feb. 2	2.4	2.4	1.2	1.8	3.6	3.0	2.8	2.4	R.W.	*
672		2.0	2.2	2.6	4.2	4.2	3.4	3.0	2.6	R.W.	May 4
673		2.6	2.6	3.0	2.6	2.4	2.2	2.6	3.2	R.W.	June 7
674		2.0	2.4	3.0	3.0	4.2	3.2	3.6	3.0	R.W.	July 12
675	Serum, Dec. 28; Virus, Feb. 9	2.4	2.2	2.6	3.6	4.4	5.0	4.6	5.6	K.D.	
676		3.2	2.8	3.6	3.2	6.0	5.4	6.2	5.0	K.D.	
677		3.6	4.2	3.4	5.6	5.6	4.8	4.2	5.4	K.D.	
678		3.6	3.6	4.2	4.6	4.8	4.6	4.4	4.8	K.D.	

R.W. = Remained Well. D.I. = Died from Injury. K.D. = Killed for diagnosis.

*Died, March 8, pneumonia.

EXPERIMENT No. 5

Object of Experiment:—To determine the value of anti-hog cholera serum when used as a curative agent.

Explanation:—A large part of the work of immunization of hogs against cholera is conducted in infected herds and different stages of the disease are usually encountered. In treating under these circumstances it is well to know what results can usually be expected from the administration of serum.

The results obtained from the use of serum in cholera that has been produced artificially will probably vary somewhat from the results obtained from its use following natural infection. In inoculation cholera the duration of the disease is known and the development in different animals would be quite uniform, whereas in cholera, the result of natural infection, the exact duration of the disease is unknown and different stages would be found in different animals. However, the results obtained experimentally should be of some value in controlling natural infection if an accurate diagnosis has been made.

Description:—The following experiment was conducted with sixteen susceptible pigs averaging about 40 lbs. in weight. They were divided into three lots, one lot of six and two lots of five each. All pigs were infected by direct injection of virus on the same day.

In lot No. 1, three pigs were used as virus controls and three given protective doses of serum simultaneously with the virus.

In lot No. 2, two pigs were used as virus controls and three given curative doses of serum at the first rise in temperature.

In lot No. 3, two pigs were used as virus controls and three given curative doses of serum at the first physical evidence of infection.

In lot No. 1, the control pigs became sick on the fourth day and died, two on the eleventh and one on the twelfth day. The serum pigs showed temperature reactions but remained healthy.

In lot No. 2, the control pigs became sick on the sixth day and died, one on the thirteenth and one on the fourteenth day. The serum pigs, treated on the fourth day after receiving virus, developed typical cholera temperatures, with slight loss of appetite for one day, but made complete recoveries.

In lot No. 3, the control pigs became sick on the fourth day, one dying on the fourteenth and the other on the sixteenth day. The serum pigs treated on the sixth day, and showing physical evidence of infection, did not respond to treatment and died on

the fifteenth and sixteenth days.

Summary.—It would seem from the foregoing that anti-hog cholera serum has curative properties when used in the initial stages of infection, but is of no value if administered after physical evidence of infection has appeared. (See Table No. V)

TABLE V
VALUE OF SERUM WHEN USED AS A CURATIVE AGENT

Pig No.	Virus	Serum	Condition	Result
145	8-11	—		Died 8-22
146	8-11	—		Died 8-23
147	8-11	—		Died 8-22
151	8-11	8-11	Serum administered simultaneously with virus	Remained well
152	8-11	8-11		Remained well
153	8-11	8-11		Remained well
154	8-11	—		Died 8-23
155	8-11	—		Died 8-24
159	8-11	8-15	Serum administered at first rise in temperature (4th day)	Recovered
160	8-11	8-15		Recovered
161	8-11	8-15		Recovered
162	8-11	—		Died 8-24
163	8-11	—		Died 8-26
167	8-11	8-17	Serum administered at first appearance of clinical symptoms (6th day)	Died 8-25
168	8-11	8-17		Died 8-26
169	8-11	8-17		Died 8-25

It is true that many hogs, physically sick from cholera, recover following the use of the serum treatment. It is also true that some hogs recover from an attack of cholera with no treatment. Again, in many outbreaks of cholera of a virulent type, the use of serum alone on visibly sick hogs has very little effect on the course of the disease.

It can be readily understood, therefore, that the results of serum treatment, in visibly sick hogs, will depend upon a number of factors, such as the resistance of the animals, the virulence of the infection and the potency and amount of serum injected. From a financial standpoint, the advisability of the use of serum in infected herds must always be contingent upon these factors.

It is desired that the foregoing work be regarded as limited in scope and while some of the results have been substantiated by additional tests, the work has not been broad enough to form absolutely definite conclusions. However, it is felt that the results obtained are sufficiently suggestive to justify consideration of their use in actual practice.

GLANDERS AND BOVINE INFECTIOUS ABORTION COMPLEMENT FIXING ANTIBODIES IN TWO APPARENTLY NORMAL HORSES¹

By FRED BOERNER, JR., *Philadelphia, Pa.*

During the month of February, 1922, the complement-fixation test for glanders was conducted at this laboratory on about 2,000 horses belonging to the City of Philadelphia. With the exception of two they all gave negative reactions to this test. The intradermal mallein test was applied at the same time without a single reaction. The two horses reacting to the serum test, but failing to react to the mallein test, were made a subject of study. One was known as No. 33 and the other as No. 60. They were from two different stables, and had been owned by the city for over three years. There was no history of glanders having ever occurred in these stables, or in the stables in which they had been prior to purchase by the city.

The intradermal mallein test was then applied to the opposite eye with negative results. The ophthalmic test also failed to give a reaction. The mallein used had been proved potent by tests on known glanderous animals and was subsequently proved potent by the same method.

Our interest was then centered on the reactions given by the serum test. The reactions to the original test were +4 with 0.2 and 0.1 cc of serum in both cases. Repeated tests with several antigens of *B. mallei* gave the same result.

The question of specificity was then studied and the first step was to test their sera with an antigen prepared from cultures of *Bact. abortus* (Bang.) The result was that positive reactions were obtained as follows: No. 33, +4 in doses of 0.2 and 0.1 cc of serum and No. 60, +4 in the dose of 0.2 cc and +1 in dose of 0.1 cc of serum. The test was repeated with several antigens and the same results obtained.

From the history of these animals they were not exposed for a number of years, probably not during their whole life, to an infection with *Bact. abortus* (Bang.).

In all these tests, control tubes of the serum, without the presence of antigen, hemolyzed readily; nevertheless anticomplimentary tests were made and both sera failed to inhibit or even retard hemolysis in the 0.5 cc dose.

¹Contribution from the Bureau of Animal Industry of the Pennsylvania Department of Agriculture. New Series No. 11.

The specificity of the reactions was further proved by absorption tests, which were applied as follows:

The sera were diluted with sufficient saline to make a 20 per cent solution; each cubic centimeter then represented 0.2 cc of serum. To one portion a heavy emulsion of washed glanders bacilli was added. To another portion washed abortion (Bang) organisms were added and a third portion was not treated at all.

All samples were then incubated for one-half hour at 37.5°C. They were then inactivated by heating at 58° C. for 30 minutes and again incubated for one hour at 37.5°C. The bacilli were then removed by centrifuging and the samples subjected to the complement fixation test with antigens of *B. mallei* and *Bact. abortus* (Bang).

In addition to the two sera under discussion, positive and negative controls and the sera from two mules were tested. The results were as follows:

Nos. 33 and 60 and a positive glanders control serum, after treatment with *B. mallei*, gave negative reactions to the test using *B. mallei* antigen, but continued to give positive reactions when tested with *Bact. abortus* (Bang) antigen. These same sera treated with *Bact. abortus* (Bang) gave positive reactions to the test with *B. mallei* antigen and a reduction in the reaction with *Bact. abortus* (Bang) antigen from +4 to +1 with 0.1 cc of serum of No. 33 and from +3 to +1 with No. 60. The two mules and negative sera reacted the same before and after treatment.

Absorption tests were also made in which the primary incubation of the mixture of serum and bacilli was carried out in the ice-box over night. This method proved satisfactory for *B. mallei* but not for *Bact. abortus* (Bang). The sera treated with this organism still reacted with this antigen and was more anti-complementary. This was probably due to autolysis of the bacilli making it impossible to free the serum of antigen.

Through the courtesy of Dr. J. A. Kolmer these sera (No. 33 and No. 60) were tested by him with antigens prepared from *Bact. typhosum*, *B. tuberculosis*, pneumococci, and gonococci. The reactions were negative in each instance.

Both animals were destroyed. A careful necropsy failed to reveal any lesions of glanders or scar tissue indicating healed lesions.

DISCUSSION

The sera of the two horses under discussion first of all contain antibodies for two widely different diseases, one common to the

horse and the other unknown to that species.

It may appear easy to account for the reaction to *B. mallei*, as glanders is a common disease of the horse and has existed to a variable extent in Philadelphia for years. The horses have been in contact, on the city streets, with many animals and have no doubt frequently used the public trough for drinking. On the other hand there is no evidence of the disease either at present or in the past having existed in this stable or in the stable from which they came.

If they are recovered cases then either the infection was so slight as not to produce sensitization to mallein and the repair of tissue so complete as to leave no trace discoverable at necropsy.

These animals were kept under observation over six weeks, at the end of which time the mallein test failed to give a reaction. This seemed to exclude the theory that they were in the incubation stage of the disease. The horses still remaining in the stable were subsequently tested and all reacted negatively.

To account for the presence of specific antibodies for *Bact. abortus* (Bang) is a still harder problem. Both of these animals were kept in the city remote from contact with bovines, and further, both were geldings.

It is difficult to satisfy ourselves that these two animals acquired the immune bodies by contact with the organisms, although this is the most logical line of reasoning. The possibility of natural amboceptor presents itself. In man and some of the lower animals there exists in the blood specific complement-fixing bodies for the red blood cells of other species. These are known as natural or native hemolytic amboceptors or hemolysins. It does not hold true that man or animal, having such substances in their blood, necessarily had to have been in contact with the antigen either directly or indirectly. In fact they are considered as hereditary and not acquired. A very few or a large percentage of individuals of one species may have amboceptor for the blood cells of another.

Might it therefore not be possible that the complement-fixing antibodies encountered in these two horses were of the nature of natural amboceptors?

Even though there is little foundation for such supposition, the questions make us think seriously concerning the possibility of the existence of natural amboceptors for bacterial proteins.

DISEASES OF SWINE¹

By EDW. A. CAHILL, *Indianapolis, Ind.*

One would be displaying considerable temerity if he were to undertake a discussion of the diseases of swine without first calling attention to the magnitude of the subject. In years past a discussion of this subject was frequently limited to the mention of cholera, tuberculosis and possibly swine plague, as being the only serious diseases of this species. Time has forced a change of opinion in this as in many other matters and as a result it is now well appreciated that swine diseases cannot be as lightly considered and easily diagnosed as was formerly supposed, but that their correct diagnosis and control is an economic responsibility which may resolve into either a tremendous asset or liability to the veterinary profession and which requires the exercise of our best diagnostic skill.

In an effort to meet this changed condition, some institutions require their students to devote from one to two years of lecture and field study to this subject. This being true, it is obviously impossible in the time allotted me to do more than consider briefly some of the more salient points of the subject as they apply in a national manner, while omitting others which might have more local significance. It is realized fully that the conditions mentioned do not describe the detailed picture which is presented in all local outbreaks of disease and they are therefore offered as the protocols of existing conditions in the country as a whole and subject to modification in specific instances.

If swine diseases are classified, either according to their importance to the practitioner in veterinary medicine, or by their economic significance to the livestock interests, it becomes necessary for us first to consider a group of septicemic diseases or conditions which are choleraic in type. Included in such a group is hog cholera, swine plague, enteritis, flu, so-called mixed infection and protein poisoning. This is indeed a motley group, regarding which little unanimity of professional opinion exists. Their existence and significance has been a favorite topic of discussion for the past few years. These discussions, both oral and written, have often been more acrimonious than enlightening, and tend to make amenable to dispute any opinion which

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the practitioner might hold, or any procedure which he might adopt, in dealing with these diseases.

As a result of these divided ideas the profession has been sharply separated into two schools holding different opinions. The one maintains that cholera is the only disease of this group which is responsible for any considerable amount of losses and that the disease is not difficult of diagnosis. The other maintains that diseases and conditions which closely resemble cholera are quite prevalent and are responsible for much sickness and mortality. They maintain that these diseases are often mistakenly diagnosed as cholera with disastrous results. The former school believes that such organisms as *Pasteurella suisseptica*, *Bacterium suispestifer* and others, frequently present in the respiratory and intestinal flora, are incapable of causing specific diseases and that the extent of their activities is limited to causing extensive secondary involvement when acting symbiotically with the virus of cholera. The latter school believes that, while those organisms do cause extensive secondary lesions in cholera-sick swine, they are also responsible for specific diseases in swine which are in no way affected with the cholera virus. In order that the claims of each school may be definitely appraised and evaluated a short review of the history of this group seems essential.

A decade or more ago it was believed that two micro-organisms were of great importance in so far as they applied to swine diseases. One of these, the *Bacillus suissepticus* (*Past. suisseptica*) was considered responsible for swine plague, which was then believed to be extremely prevalent. The other, *Bacillus suispestifer* (*Bact. suispestifer*), later referred to as the hog cholera bacillus, was believed to be the causative agent of hog cholera. About this time our opinions regarding swine diseases were modified considerably, due to the epoch-making discovery of Dorset and his co-workers, that hog cholera was caused, not by *Bact. suispestifer* but by a filterable virus. Following this discovery it was then assumed that these two organisms, *Past. suisseptica* and *Bact. suispestifer*, together with others which are normally present in the flora of the respiratory or intestinal tracts, were not as significant as formerly supposed, and that they were capable of causing pathological changes, only if they acted symbiotically with hog cholera virus. Experimental data which would justify this radical change of opinion were not available and while European investigators have presented much data which should have controverted the belief, it was generally accepted in this country.

With the discovery of the filterable virus of hog cholera came the discovery of a method of producing an immune serum capable of immunizing against hog cholera. From an economic point of view this discovery was of paramount importance, because it has resulted in the protection of thousands of swine which would otherwise have died from cholera. History shows that the practical application of many important discoveries, particularly those of medicine, is retarded by the extreme enthusiasm with which the discovery is received, since we invariably hope for and expect more from such discoveries than the possibilities justify.

The attitude adopted by our profession, following the discovery of the cause and means of preventing hog cholera, has been no exception to this general rule. Not content with the wonderful ability of anti-hog cholera serum to control hog cholera, the most serious of all swine diseases, we allowed ourselves to believe that it would act as a panacea for most swine diseases, and that if we controlled hog cholera other diseases would have little or no significance. For several years this belief was apparently substantiated, because of the fact that most sick swine proved to be affected with hog cholera, and in the majority of cases anti-hog cholera serum controlled the losses.

For several years subsequent to the acceptance of this belief there were occasional cases in which the serum failed to control the losses, or in which apparently healthy animals became sick after vaccination. These cases represented but a small percentage of the herds treated and unfortunately were seldom carefully investigated, since they were considered as failures of the serum or virus to obtain the desired results. In other words these cases were spoken of as hog cholera "breaks," due to impotence of the products used, and while a small percentage of such cases might be explained in this manner it is to be regretted that more study was not given to such cases.

There is now every reason to believe that during these years we were unknowingly dealing with atypical cases of diseases which symptomatically are closely allied to cholera and which are caused by the bacteria, which, in previous years, were considered important. During the past five years these cases have become exceedingly numerous and it has been observed that many animals which were apparently healthy at the time of vaccination have developed post-vaccination sickness, and that in other cases anti-hog cholera serum, when administered to sick

swine, failed to check the losses, particularly in herds where intestinal and pulmonary symptoms and lesions were pronounced.

Thus it became obvious, either that the serum treatment was not so effective as formerly, or that swine might be affected with diseases other than cholera. Since that time an enormous amount of work has been conducted by investigators to determine which of these conditions prevailed and while there still remains much to be learned, the utilization of facts which have been determined by combined laboratory work and field observation are most salutary for the practitioner who is more concerned with results than an adherence to ideas which are theoretically correct but obsolete for practical purposes.

Before entering into a discussion of the various diseases the following conclusions are offered. It will be noted that in some respects they do not agree with the older text books. For this no apologies are necessary, but the assurance is offered that their application by many of the country's largest swine practitioners has been of material assistance in controlling disease.

1. Hog cholera still continues to be the most serious of all diseases of swine.

2. Hog cholera vaccination has not lost any of its effectiveness and is as valuable now as at any previous time. Any propaganda or beliefs which lessen the confidence of the public in this valuable immunizing procedure will naturally reduce the number of immune animals and increase the percentage of susceptible swine, thus constituting a serious menace to the live stock industry. It matters not whether this result be brought about by those who still insist that all extensive losses of swine are caused by hog cholera or whether it be brought about by irresponsible persons holding erroneous beliefs as to the existence of disease the presence of which has not been proven. There is a happy medium which must be adopted by those who would successfully control swine diseases.

3. That diseases other than cholera do exist and are both widespread and serious. They are serious because it may be found difficult to differentiate between these and hog cholera and since failure properly to differentiate frequently causes discredit to be thrown upon hog cholera immunization. Lesions formerly considered diagnostic of cholera are known to exist in other diseases, and because of this, differential diagnosis is difficult and frequently erroneous.

4. Swine, more than any other genus of animal, possess an

uncanny ability of harboring chronic pulmonary or intestinal lesions, although appearing perfectly healthy. This fact is responsible for most post-vaccination troubles in swine and is too frequently overlooked, when such cases are under investigation. However, this knowledge should not eliminate proper recognition of the occasional, true, cholera "break" which does occur.

5. Hog cholera should always be suspected, regardless of symptoms or lesions, if the affected animals are susceptible to cholera. Conversely, if the affected animals have been properly immunized, and they display the syndrome of other diseases, they should be treated for such, since treatment for cholera will be devoid of results and will destroy confidence in the simultaneous treatment.

6. The majority of our profession have been grossly negligent in so far as they have failed to attach sufficient importance to the question of sanitation. Proper housing, feeding and improved sanitation do much to prevent the propagation of bacterial infections and parasitic infestations of swine.

7. Parasitic infestations in swine are rapidly increasing and must receive our serious consideration, since in addition to the damage for which they are directly responsible, they so devitalize the system that bacterial infection is made possible.

HOG CHOLERA

While this disease still continues to be the most serious of all swine diseases, experience during the past few years has conclusively demonstrated that cholera is not so easily diagnosed as was formerly supposed. Some have maintained that this is a lesionless disease, and while this opinion has not been generally accepted, it must be conceded that cholera is devoid of typical, specific lesions which make its recognition a certainty. Many have felt safe in making a diagnosis of hog cholera, provided post-mortem examination evidenced the presence of petechial hemorrhages throughout the body, or button ulcers on the intestinal mucosa, or both. This erroneous attitude is undoubtedly responsible for more of the chaos and uncertainty which now applies to swine diseases than any other factor.

The only lesions that can be attributed to the filterable virus are those of an acute septicemia, viz: petechiation, but unfortunately this same condition becomes manifested in animals suffering from other conditions and petechiation is an extremely prevalent condition in septicemias caused by streptococci, *Ps.*

pyocyaneus, *Bact. paratyphosum* B., *Past. suiseplica*, et al. Petechia are also observed in animals which have been subjected to extremes in temperature; in those which have been fed on excessively oily or acid material; and in those which have been fed on a ration too rich in proteins; as well as in individuals suffering with parasitic infestations. In view of this knowledge it should require little discussion to convince one that, while petechia are the most constant lesions observed in swine affected with cholera, a diagnosis made on this widely prevailing phenomenon is most insecure and undesirable and that there is no one lesion in cholera-sick swine which can be accepted as conclusively diagnostic.

A second pathological change which is frequently responsible for an incorrect diagnosis in swine is the presence of button ulcers in the intestinal mucosa. At one time it was believed that hog cholera could be diagnosed in the presence of this pathological condition. It has, however, been quite conclusively proven that button ulcers are caused by bacteria normally present in the intestinal flora and that they are not caused by the filterable virus.

Those whose experience permits them to autopsy large numbers of pigs know that button ulcers are observed alike in cholera-sick, cholera-immune and susceptible swine. In swine button ulcers are frequently observed following any intestinal infection, although the remainder of the herd remains well and may later be demonstrated to be susceptible to hog cholera.

What then is the present status of the lesions formerly considered diagnostic of hog cholera? In so far as button ulcers are concerned, it may be said that although these are frequently observed in swine affected with hog cholera, a diagnosis cannot be made on this point, since the ulcers may be observed in swine not affected with hog cholera, and since they are caused by bacteria normally present in the intestinal tract but not by cholera virus. In so far as petechia of the various organs are concerned, these may be present in swine affected with hog cholera, or they may be present in animals affected with numerous other diseases or conditions.

A correct diagnosis of hog cholera is beset with many difficulties and it can safely be made only by a thorough study of the history, symptoms and post-mortem lesions. Most careful investigators are at this time of the opinion that more dependable information for diagnostic purposes is obtained by an extremely thorough study of the symptoms and history, than by placing too much

dependence upon post-mortem lesions. While the post-mortem lesions of cholera closely resemble those found in other diseases, the history and symptoms are distinctly different. In view of these circumstances greater consideration should be given to a thorough study of the history and symptoms, without lessening our diligence in post-mortem investigation.

It is becoming more generally appreciated that the expressions "vaccination" and "immunization" against cholera are not synonymous. The public should be taught that vaccination is a mechanical process, while immunization is the end-result of proper vaccination and is dependent upon many immunological factors over which the operator has no control. Active hog cholera immunization is the nearest example of absolute immunity which is exhibited by animals, yet certain field conditions justify the belief that under certain unknown conditions this strong immunity may be shattered. Those who are called upon to investigate post-vaccination trouble cases know that in many instances they are dealing with a low type of cholera and that the disease is diagnosed as hemorrhagic septicemia or some other disease, on account of atypical cholera manifestations and a preponderance of secondary lesions.

Investigation has conclusively demonstrated the fact that the majority of such cases are due either to the use of insufficient doses of virus or to the vaccination of pigs while they are yet too young. The risk involved in the use of small amounts of virus is much greater than from using too much. Strict adherence to a minimum dose of two cc will do much to eliminate these cases. Fortunately the demand upon veterinarians for the vaccination of pigs under forty pounds is gradually lessening. Experience has proven to most practitioners that many pigs vaccinated as babies will develop cholera if they come in contact with virulent virus at a reasonable period subsequently. Animals so vaccinated are never safe for brood purposes and it is this class of hogs which keep alive a low type of atypical cholera which is difficult of diagnosis.

HEMORRHAGIC SEPTICEMIA

Probably no disease in animals has been the cause of more animated discussion than hemorrhagic septicemia. This is not a new disease, but is an appellation now generally given to swine plague which, previous to 1900, was considered to be extremely prevalent in this country. Subsequent to the discovery of hog

cholera virus, *Past. suisepitica*, the causative factor in hemorrhagic septicemia, was relegated to the list of bacteria having little pathological significance. For more than fifteen years it retained its subservient role, notwithstanding the fact that our European confreres were constantly reporting authenticated cases of swine plague.

When the increased number of post-vaccination trouble cases could no longer be ignored and investigations were begun, it was found that the filterable virus of cholera was not present in the blood of many of these cases and that the trouble was something other than cholera. It was then determined that in many of these cases *Past. suisepitica* was isolated, sometimes in mixed, but more frequently in pure culture, from various parts of the body. When animal inoculation proved the virulence of the organism, hemorrhagic septicemia was diagnosed. This diagnosis met with a storm of protest from persons located in sections of the country other than the corn belt, and whose activities were largely of a laboratory nature, but with limited opportunities to observe these changing field conditions.

Those who decry the increased prevalence and importance of this disease do so largely because *Past. suisepitica* is considered by most investigators to have but little pathogenicity when injected into swine, and because Moore and other investigators have shown that the organism is normally present in the respiratory tract of a large percentage of healthy swine. This latter fact is used to minimize the significance of cultures obtained from sick swine. Those opinions are, to a considerable extent, modified by the recent work of Spray, who shows that *Past. suisepitica* is normally present in but a very small percentage of healthy lungs, but in a very high percentage of pneumonic lungs.

The significance of *Past. suisepitica* isolated from the lungs is debatable, but the significance of this organism, when isolated in pure culture from the blood, spleen, glands or abdominal exudate, can hardly be questioned. In many outbreaks of disease *Past. suisepitica* has been isolated in pure culture from organs other than the lungs, its virulence has been proven by animal inoculation and the organism recovered from the inoculated animals, thus fulfilling all the postulates usually considered necessary to diagnose a specific disease. In addition, the absence of the cholera virus has been demonstrated by animal inoculation. The alleged inability to reproduce this disease by injecting swine with *Past. suisepitica* becomes mythical, if instead of using stock

cultures, whose virulence has been largely destroyed by long-continued, artificial cultivation, investigators will use as their antigen strains freshly isolated from the acute cases known to exist in the corn belt.

It is hoped that this discussion will not be interpreted as meaning that a diagnosis of hemorrhagic septicemia is always justified. I hold no brief for the disease as such and I know that, as in other genera of animals, it has at times been diagnosed when proper investigation revealed other causes for the trouble. To deny its prevalence, however, when its existence can be proven bacteriologically, and when the clinical and post-mortem picture of field cases is identical with that described in text books, is to invite a continuation of the diagnostic difficulties which have existed.

We have no way of knowing the degree to which this disease exists in Pennsylvania, but assume that it is a negligible factor. It has been stated that the disease does not exist in the East. This is not correct, since it has been definitely diagnosed in New Jersey, New York and New England. In the latter it prevails extensively, but probably in no Eastern state is it as prevalent as in the West.

The cycle of this disease is clearly defined. Previous to the discovery of anti-hog cholera serum this disease was wide-spread and acute in character. Gradually its virulence and incidence waned and only chronic cases were seen, while during the past few years the causative agent has developed enhanced virulence and the disease has become extremely prevalent and acute. The symptoms and lesions of uncomplicated hemorrhagic septicemia in swine are almost identical with those in other species, but we are less willing to accept them as such, since at least one other disease—cholera—displays practically the same lesions. If this disease is not recognized and is erroneously diagnosed and treated as hog cholera, alarming and extremely undesirable results generally follow the administration of the simultaneous treatment.

Many so-called "breaks" subsequent to vaccination are due to the activities of *Past. suisepitica*, the causative agent of this disease. Benner and Birch have observed that swine possess a marked ability to harbor chronic lung lesions, although apparently in perfect health. This observation, made by Eastern investigators, is well appreciated by swine practitioners throughout the hog belt. It is known that the majority of swine have, during the past few years, harbored a small area of infection in

the apical lobe of the lungs. This small area, which is glazed in appearance and heavily infiltrated with a serous exudate containing *Past. suis septica*, remains localized until some devitalizing condition results in the liberation of the organisms, followed by an acute attack of hemorrhagic septicemia.

This devitalization may be brought about by several conditions, such as shipment, exposure to inclement weather, insanitary surroundings, improper housing or feeding. One of the most common of these, however, is the administration of hog cholera virus in the form of the simultaneous treatment. When any of these devitalizing conditions are superimposed upon this latent infection, an acute attack of disease generally follows. If it were possible for all of us to destroy and autopsy a considerable number of apparently healthy animals, and observe this chronic affection of the apical lobe, skepticism regarding this disease would rapidly disappear, and if, after such an autopsy, the remainder of the apparently healthy herd could be subjected to the simultaneous method of hog cholera immunization, and the results noted, there would be fewer who would diagnose the resulting conditions as hog cholera "breaks" and more who would more accurately diagnose these as hemorrhagic septicemia.

Too frequently post-vaccination troubles are diagnosed as cholera, merely because autopsy reveals petechiation of various organs. As pointed out previously, this condition may be indicative of hemorrhagic septicemia or other conditions as well as cholera, while in recently immunized animals petechiation is not abnormal, even though the animals remain well. If such cases are carefully investigated, the symptoms are generally negative to cholera and lesions which are indicative of other conditions can generally be observed. Not infrequently our diagnosis is incorrect, not for want of lesions, but because of our unwillingness to appraise them definitely.

DIFFERENTIAL DIAGNOSIS

The clinical picture, both ante- and post-mortem, of animals affected with hemorrhagic septicemia is sufficiently different from the clinical picture of hog cholera that there seems little justification, in most cases, for an erroneous diagnosis. Hemorrhagic septicemia is characterized ante-mortem by a rapid onset, intense coughing and labored breathing, resembling so-called "thumps," and by a unilateral or bilateral nasal discharge. The appetite is retained, except in the peracute cases, where marked

prostration is the rule. The temperature is frequently inverse to the symptoms. Sick animals may show a normal temperature, while those which physically appear healthy have temperatures ranging from 104° to 108°. In either case the temperature does not remain consistently high, as in cholera, but fluctuates considerably from day to day.

Hog cholera, on the other hand, is typified by progressive infection which gradually affects the entire herd, the onset is not sudden, the temperature is elevated and does not fluctuate to any degree, while the affected animals manifest a peculiar breaking or knuckling at the hocks, which is not observed in other diseases. This knuckling is characteristic and ought not to be confused with staggering from intense weakness, which may be observed in any disease. Inappetence and a tendency to hide in the bed is marked, while diarrhea is fairly constant. The mortality in cholera is excessively high, while in hemorrhagic septicemia it is comparatively low. In cholera flesh is lost rapidly, while in hemorrhagic septicemia this is not so noticeable.

Unless there be a secondary pulmonary infection, animals affected with cholera show a marked absence of cough, nasal discharge or labored breathing. Petechiation is the only post-mortem lesion which can be attributed to the filterable virus. Extensive lung or intestinal lesions are proof positive of secondary infections. Although petechiation cannot be depended upon for diagnostic purposes, since it is characteristic of both diseases, there are a few fine points of differentiation which are of significance in septicemias other than hog cholera. In these diseases petechiation tends to be irregular in size and outline, and to vary from pin-point size to large splotches. In uncomplicated hog cholera the ecchymoses consist of small, circumscribed areas, uniform in size and shape, with a tendency to be pronounced and clearly defined in two specific places. These are the crest of the ileocecal valve and the lymphatic glands. In hog cholera the lymphatic glands are generally enlarged, quite dark, and upon cross-section reveal clean-cut, isolated, circumscribed petechiae, whereas in other diseases caused by bacteria the lymphatic glands tend to become enlarged and engorged with little tendency for well defined and circumscribed petechiation.

The peracute type of hemorrhagic septicemia is most apt to be confused with cholera. In this type onset and death are usually sudden and the post-mortem changes are limited to hemorrhages and petechiae. It is in these cases that the different

appearance of the petechiae will be of assistance. In the acute cases the symptoms are classical and the constant presence of pathological changes in the lungs, varying from congestion to red and grey hepatization, or even necrosis, with marbled areas, makes a diagnosis comparatively simple. In swine which have been properly immunized against cholera a differential diagnosis is not particularly difficult, if the entire syndrome is considered.

However, we face a different condition in swine which are susceptible to cholera, and it cannot be too strongly emphasized that in these cases a diagnosis of hemorrhagic septicemia be most guarded and that any treatment which may be recommended for that disease be made supplemental to the use of anti-hog cholera serum. Where hemorrhagic septicemia is suspected, but protection against cholera is considered necessary, the serum-alone treatment offers the most rational procedure. If the simultaneous treatment be used, a very heavy mortality usually follows on account of the virus being superimposed upon an already existing infection.

NECROTIC ENTERITIS

This disease has, for several years, been very prevalent in some sections of the country. At one time it was termed intestinal necrobacillosis, and *B. necrophorus* (*Actinomyces necrophorus*) was supposed to be the etiological factor. More careful observations revealed the fact that *B. necrophorus* was incapable of causing the disease, and that it acted only in a secondary manner, after the intestinal mucosa had undergone pathological change. The expression "intestinal necrobacillosis" is therefore a misnomer. Kechn believes that *Ps. pyocyaneus* is the causative agent, but this belief has not been substantiated, while Murray, Benbrook and Dimock believe that the protozoon, *Balantidium coli*, is responsible for the condition.

The majority of investigators now believe that several bacteria ordinarily present in the intestinal flora may be the exciting factor. At least two of these, *Bact. paratyphosum* B. and *Bact. suispestifer*, are known to be capable of causing this condition, after the normal tolerance between bacteria and host is disturbed and the resistance lowered by any devitalizing condition. Like other bacteria of low virulence these organisms may, under certain conditions, develop enhanced virulence and become so pathogenic that at times the disease becomes highly contagious, although ordinarily it is sporadic in type. Since necrotic enteritis is not difficult of

diagnosis, the important factor connected therewith is the fact that this disease can and does exist as an entity in swine which are immune to hog cholera, as well as in cholera-susceptible swine.

Animals affected with this disease must be handled in a manner entirely different from those affected with hog cholera. This condition undoubtedly results from parasitic infestation more frequently than is generally appreciated and for this, if for no other reason, parasitism in swine deserves our serious consideration. The disease is characterized first by an acute enteritis, affecting the intestinal mucosa and associated lymphatic glands. Following a passive congestion and formation of a diphtheritic exudate on the intestinal mucosa, there is a thickening of the entire intestinal tract, which at times becomes so intense that the lumen may be almost occluded. Secondary invaders now become active and are responsible for the button ulcers and necrosis which follows. This necrosis may involve large areas of the intestinal tract which eventually become dry and leathery in appearance.

Clinically the disease is characterized by progressive emaciation and the inability on the part of the affected individual to assimilate its food through the necrotic or dried intestinal mucosa, resulting in progressive and intense emaciation. This entire syndrome, spoken of as "necrotic enteritis," is practically the same condition as described by Salmon and referred to as Salmonellosis, hence it is not a new disease.

MIXED INFECTION

This is a meaningless expression, the use of which is fortunately largely discontinued. It is of course admitted that two infections may co-exist in the same animal, but this does not justify the use of the term "mixed infection" as though it were a specific disease. In diphtheria, and in tuberculous lesions, bacteria other than the specific causal organisms are generally active, yet those diseases are not spoken of as mixed infections. In swine so-called "mixed infection" proves upon proper investigation to be either hog cholera, hemorrhagic septicemia or necrotic enteritis, or a combination of these. A diagnosis of mixed infection is a blanket covering ignorance, which lowers us to the level of the charlatan, whereas the diagnosis of a specific disease puts the professional man on a pinnacle which the laity will not even approach. In order to obtain desirable results our treatment, like our diagnosis, should be specific—not "shot-gun" in character.

"FLU"

During the past few years considerable difference of opinion has existed regarding the possibility of a disease in swine which might be likened to influenza in the human. This has been designated as "flu," and its existence as a specific disease has been a point of considerable dispute. With one exception all investigators who have studied this alleged condition have denied its existence, while many have isolated *Past. suisseptica* in pure cultures from supposed cases. During the past few months the Bureau of Animal Industry has added a somewhat official recognition to this disease. The value of this recognition lies not in the defining of the symptoms, cause and lesions of a recognizable disease, but in the admission that swine do suffer with septicemic conditions similar to cholera in which the filterable virus is absent.

None of the investigators has been able to define the causal organism which might be responsible for this disease; neither have they been able to outline the syndrome which would include symptoms and lesions sufficiently accurate that this disease might be differentiated from others. The symptoms generally attributed to "flu" are extremely rapid onset, coughing, disturbed respiration, including thumps, prostration, a rise in temperature, all of which affect the majority of the animals in the herd. The mortality is not more than two to three percent and recovery is about as rapid as the onset. The most serious factor of this condition is the loss of weight of the affected animals.

Several of the best authorities on swine diseases are of the opinion that "flu" is a peracute form of hemorrhagic septicemia and is not a specific disease. Since others take the opposite opinion and since the mortality accompanying the disease is not serious, we can well afford to wait for investigations which will more definitely ascertain the true status of this alleged disease.

BOTULISM

Some months ago the veterinary world was startled by the publication of an article which left the impression that most post-vaccination trouble in swine was botulism and that the condition might be brought about by contaminated serum and virus. The consequences of such a condition, if proven, would be so serious that they could hardly be estimated. Extended investigations which have since been conducted by the writer and others indicate clearly and conclusively that swine are much

more resistant to botulism than other animals, and that there is no danger of anti-hog cholera serum or hog cholera virus containing botulinus toxin. One need not fear his ability to differentiate between botulism and other diseases of swine, since the clinical picture of the former disease is entirely unlike that of any of the diseases which are prevalent. The symptoms are entirely of the nervous system and in a manner resemble tetanus. There exists considerable doubt as to the existence of this disease in swine, except cases where the animal has been artificially infected.

ERYSIPELAS

This disease has appeared during the past few years in several western states. Its existence has been confirmed by bacteriological findings. Since the disease is quite prevalent in Mexico, its introduction into this country on a larger scale would not be particularly surprising, but would be a matter of concern. Fortunately the symptoms and lesions of the disease differ sufficiently from other diseases that it is usually not difficult to diagnose.

MALIGNANT EDEMA

This disease is somewhat more prevalent in swine than formerly. On a few occasions outbreaks have been due to the presence of the causal organism in the virus used in vaccinating against cholera, but in most instances the outbreak has been due to the presence of the causative organism on the skin of the hog or in the soil. The needle wound following immunization has furnished the portal of entry.

ABORTION

As might be expected, abortion disease in swine is greatly on the increase. In many instances the affected sows have followed infected cattle or been pastured on adjacent ground. There are many cases, however, which cannot be explained in this manner, nor can the means of transmission be determined. It is to be hoped that shipping centers for swine will not become as generally infected with *Bact. abortus* (Bang) as they now are with other viruses. As difficult as is the problem of handling abortion disease in cattle, it is considerably enhanced in the case of valuable swine. The detection of aborters and cases having vaginal discharge is exceedingly difficult, while proper segregation is almost an impossibility. If the prevalence of this disease continues to increase its control will present an exceedingly serious problem.

From the above it is quite apparent that we may safely assume that, with the exception of abortion disease, there are no new diseases of swine which are of particular significance and that our efforts should be concentrated on the control of hog cholera, hemorrhagic septicemia and necrotic enteritis. These three diseases, like most other infectious diseases, have a well defined cycle and the diseases are prevalent, and the symptoms and lesions acute, in proportion to the virulence possessed by the organism which is responsible for each disease.

Hog cholera generally travels in cycles of approximately seven years. Between these years the virulence of the virus gradually diminishes and the incidence of the disease becomes extremely low; then after a period of years the virulence and incidence gradually increase, until the disease again assumes serious proportions. The same condition applies to hemorrhagic septicemia and necrotic enteritis. These diseases travel in cycles, although their period of ascendancy and quiescence is not quite so clearly defined. These, like most infectious diseases, are not difficult to diagnose when their incidence is high and the symptoms typical, but their diagnosis becomes increasingly difficult when they become subacute and atypical in character.

While these diseases are prevalent, it is necessary that we be capable of diagnosing hemorrhagic septicemia and necrotic enteritis, in order that these diseases may not be diagnosed and treated as hog cholera, since satisfactory results are rarely observed under such conditions. There is equally great danger of low-grade hog cholera, accompanied by atypical symptoms and lesions, being diagnosed and treated as necrotic enteritis or hemorrhagic septicemia. Both of these errors have been and are being made and it is such errors which preclude the possibility of successful treatment, or of retaining public confidence.

It is a notorious fact, as stated before, that necrotic enteritis and hemorrhagic septicemia are most frequently diagnosed in sections of the country where "baby-pig" immunization is the rule, and it is equally well known that in these sections the treatment is not entirely successful on account of mistaken diagnoses. Conversely, hemorrhagic septicemia and necrotic enteritis are far less frequently diagnosed in sections of the country where swine are never given the simultaneous treatment until they reach forty pounds in weight, yet in these sections, when these diseases are prevalent, the affected animals respond to specific treatment in a satisfactory manner.

The corollary is plain when animal inoculation, combined with a thorough field investigation, proves the presence of cholera virus in the former and its absence in the latter cases. Without desiring to open a discussion on "baby-pig" immunization, which is a controversial point, it may be said that the preponderance of experimental evidence still indicates that "baby-pig" vaccination is not entirely dependable, while practical investigation indicates that many cases of low-grade cholera in pigs vaccinated as babies are diagnosed as other diseases. It seems advisable, therefore, that insofar as possible, the immunization of baby pigs should not be practiced and that whenever this practice is necessary that such individuals should be revaccinated at a subsequent date.

While it is generally appreciated that the organisms responsible for necrotic enteritis and hemorrhagic septicemia are normally present in the body of many healthy individuals, and become pathogenic only when the vitality of the host is lowered, it is likewise true that these diseases are, to a large degree, continually propagated by improper surroundings, such as insanitary hog wallows and feed lots which are used continuously over a period of years. These latter conditions offer excellent pabulum both for the organisms responsible for these diseases and for parasites causing animal infestations.

The practitioner who does not devote a reasonable portion of his time to eliminating such conditions is falling considerably short of doing his full duty. Likewise a proper survey of the housing facilities and the diet which affected animals are receiving is of the utmost importance. Many cases which clinically cannot be distinguished from hemorrhagic septicemia and so-called "flu" are known to be due to the condition now referred to as protein poisoning, which is characterized by intense prostration and thumps. It is common experience that in many such cases the only treatment which is required is a complete change of diet and the elimination of highly nitrogenous food.

In conclusion I would urge you to realize that the main difference between success and failure in the control of swine diseases lies in the observation of small details. The expert whose services are always in demand for consultation fully appreciates that his consultant has had an opportunity to observe all that is necessary to make a diagnosis, yet in spite of this the one is frequently successful where the other fails. This is possible because the former has long since learned that the

difficulties in swine diagnosis are eliminated by observing closely the most minute details of history, symptoms and lesions and to appraise each for its true worth. In addition to this he fully appreciates the value of making a diagnosis, only after he has made a careful survey of the sanitary conditions, housing and feeding.

When the practitioner learns the value of making such a survey a part of his routine procedure, and insists on examining in a most deliberate manner the apparently healthy swine which he intends to immunize, he will discover many which are not in proper condition for immunization, thereby eliminating post-vaccination troubles and thus gain the confidence of his community. The practitioner who follows this procedure feels no need for coining new names for old diseases, nor for originating new diseases to cover up post-vaccination trouble cases, due to conditions which a more acute observer would have detected before vaccination.

Plan To Go To Montreal, August 27-31.

VETERINARY SERVICE

The veterinarian should have recognition for the service he can and does perform in disease control. What, for instance, would be the status of our hog industry at the present time if it had not been for the service in hog cholera control rendered by the veterinary profession? At the present time we have several animal disease problems seriously in need of the service the competent veterinarian can give. Notable among these are tuberculosis in cattle, swine and chickens, abortion in cattle and swine, and others only partially solved or as yet practically untouched. Furthermore, we may expect new diseases in the future, if we are to judge by the past. So we need a competent veterinary force on guard and ready to serve.

The practicing veterinarian has an important place in the live stock industry of the community he serves. He can fill that place only if he has the confidence of the community and the service he can render is recognized. If he deserves that confidence, the Illinois plan, by acquainting farmers not only with the veterinarian himself but also with veterinary problems, should prove beneficial.

Editorial in *Chicago Daily Drovers' Journal*.

AN EPIZOOTIC OF ASPERGILLOSIS IN CHICKENS

By JOHN E. GUBERLET, *Stillwater, Okla.*

*Parasitologist, Oklahoma Agricultural Experiment Station**

During the late winter and spring of 1922 an epizootic of aspergillosis was prevalent in flocks of poultry in the vicinity of Stillwater, Oklahoma. The writer has encountered this disease in individual birds on other occasions, but usually only a single bird in a flock was affected. In this particular locality the disease became an epizootic and appeared to be fairly contagious. The disease occurred especially among birds that were confined in small pens, where they had exceedingly limited scratching pens, and where the litter was not changed as often as necessary. A number of poultry raisers suffered losses of more than 50 percent of their flocks during this epizootic. Birds on the same farms that were allowed free range, but given the same feed, were far more resistant than those closely confined. In fact some farmers apparently lost none of their birds that were on free range.

Aspergillosis has been observed in the United States by a number of writers but it seems that the records show in most instances only occasional cases and not in epizootic form. Ward and Gallagher (1922:112) state that young chicks frequently are attacked by an acute form known as brooder pneumonia. A number of cases have been recorded of birds confined in parks, such as cases reported by Mohler and Buckley (1902), from the National Zoological Park in Washington. Aspergillosis is no doubt more prevalent than we realize, as it may often run a mild and harmless course, as suggested by Moore (1916:286). The writer deemed it advisable to report upon the conditions that he has found, as it seemed rather unusual for such a severe epizootic of this nature to occur among adult birds.

PREDISPOSING CAUSES

The predisposing causes of this epizootic of aspergillosis were due to a number of conditions. The birds chiefly affected in each case were confined in small pens and were given a diet with a high percentage of protein. In addition to this they had a very small amount of litter in which to scratch and therefore had very little exercise and no green feed whatever. Certain of the

*Resigned July 1, 1923.

conditions and symptoms resemble the nutritional disease discussed by Beach and Freeborn (1922:15). This was especially true for some weeks before the epizootic of aspergillosis began. Before the aspergillosis symptoms appeared there were some birds which showed typical symptoms of the nutritional disease, probably visceral gout. At autopsy a number of the birds showed very pale kidneys, a typical protein poisoning, also chalky urate deposits on the liver, pericardium and other organs.

When the birds were in this weakened condition a supply of feed was obtained which was in a very moldy condition, really unfit for feeding. After this was fed for several weeks the epizootic of aspergillosis began. Without exception, on the poultry farms where aspergillosis was prevalent, feed was obtained from one particular feed house, which had a supply of moldy feed on hand. On the farms where the birds had free range and some green feed, they had enough natural resistance to withstand the *Aspergillus* spores, but where the birds were closely confined, and were already suffering from a nutritional condition, they became easy victims to the attacks of *Aspergillus fumigatus*.

SYMPTOMS

The first symptoms appear in eight to twelve days after inoculation with spores of *Aspergillus fumigatus*, the incubation period being practically the same for inoculations, whether they were oral, intratracheal or subcutaneous. The first condition that is noticed is a lessened activity of the bird, a slightly diminished appetite, a slightly darkened comb, especially at the edges. This is followed by isolation, droopiness, ruffled feathers, elevated temperature, much darkened comb, complete lack of appetite and great thirst. As the disease progresses there is a marked diarrhea accompanied by emaciation and weakness.

During the advanced stages the eyes become watery and the eyelids may adhere, but as a rule there is no accumulation of cheesy material within the eyelids. There may be a watery discharge from the nostrils, accompanied by rattling sounds during respiration. After four or five days the birds become prostrate and gradually pass into a comatose condition and die. In the advanced stages of the disease there is always a typical, foul odor present, whether the bronchi, lungs, air spaces or alimentary tract are involved.

The symptoms may vary somewhat according to the organs involved. If the mouth and esophagus are affected, the birds may

have difficulty in swallowing, and there are usually cheesy, yellowish-white or gray nodules in the mouth and esophagus. When the bones are affected the bird will show lameness. When the lungs and bronchi are involved, breathing is quickened and there is frequent sneezing and often gasping for breath.

TREATMENT

Very little apparently could be done in the treatment of the sick birds. A number of different remedies were tried, but nothing seemed to prove effective after the birds began to show symptoms. The lives of a few of the affected birds apparently were prolonged from one to five days by feeding potassium iodide, but none were cured. All of the affected birds, or any that appeared in any way suspicious, were isolated and the rest of the flock were taken away from the old pens and turned out on a range where they had plenty of green feed and at the same time nearly all protein feeds were discontinued.

Very few cases of aspergillosis occurred after the birds had access to new and clean surroundings with plenty of green feed. Cleanliness, both of the premises and of the feed, sufficient range and green feed seem to be the preventive measures necessary to keep aspergillosis from starting in a flock.

POST-MORTEM LESIONS

Autopsies on birds where the lungs, bronchial tubes and trachea were involved showed large masses of mycelia, sterigmata and spores of *Aspergillus fumigatus*. The trachea and bronchi in some cases were completely filled with the mycelial mass. White, gray, or greenish nodules or masses were displayed within one or both lungs. These were composed of a mycelial mass, together with a caseous exudate, consisting of epithelial cells, leucocytes, and sometimes some red blood corpuscles. Frequently abscesses are found in the areas immediately adjoining the lungs.

When air-spaces throughout the tissues of the body and bones are affected, these areas are more or less filled with pseudo-tubercular nodules. The nodules range in size from that of a pin-head to nearly that of a small pea. Such nodules are composed of mycelia and a caseous material, composed to some extent of degenerate cells. Some cases show numerous nodules in the subcutaneous tissue. These vary in size from that of a pin-head to that of a pea. Similar nodules may be found in the spaces between the muscles.

Autopsies on birds where the mouth, esophagus and intestines are involved show numerous nodules, especially in the pharynx and esophagus. Nodules are also occasionally found in the crop, proventriculus and even in the small and large intestines. In the alimentary tract the white or grayish nodules are bead-like in appearance and vary in size from that of a pin-head to that of a large pea. Microscopically, they are composed of mycelia, numerous flattened or flaky epithelial cells, which have become degenerated, and leucocytes.

There is also found associated, with the other elements in these nodules, numerous yeast cells (*Saccharomyces* sp?). The yeast cells do not appear to be pathogenic, however, because when large numbers of the cells were given to healthy birds, either orally, intratracheally, or subcutaneously, the results were negative. The yeast cells were not found in lesions other than those in the alimentary tract. The yeast cells were cultured very readily from the lesions, intestinal contents and from the grain that was being fed to the birds. All birds autopsied were extremely emaciated and nearly all of them showed that death resulted from intoxication.

CULTURE MEDIA

Cultures were made from the lesions in various parts of the body, at the autopsies of affected birds. Growths of *Aspergillus fumigatus* were readily obtained from the lesions, as well as from the contents of the alimentary canal and droppings. In making the cultures from the lesions of the alimentary tract, and also from the contents of the tract, cultures of a yeast (*Saccharomyces* sp?) were obtained. Luxuriant growths of both the yeast and *Aspergillus fumigatus* were obtained from the feed given to the birds. The media used in cultivating the mold were bread, potato and beer-wort agar.

EXPERIMENTS

A large number of experiments were performed on birds to determine the cause and the course of the disease. Several are reported here in detail. The chickens used in experiments 1 to 9, inclusive, are from a flock that was fed practically the same ration as the birds in the affected flocks. Their diet consisted of a high percentage of protein. At the time the experiments were begun they were in good health.

Experiment No. 1. April 6, 1922. Vigorous male bird. Given subcutaneously 10 cc of a suspension, in physiological salt

solution, of *Aspergillus fumigatus* spores taken from macerated nodules. The bird appeared normal in every respect until April 14, when it appeared less active than usual. The comb showed slight, darkened areas, especially at the edges. April 15: Symptoms were marked, comb very dark, bird droopy, lack of appetite and great thirst. Temperature $108\frac{1}{2}^{\circ}\text{F}$. April 16: Bird gradually grew worse, weaker, and a marked diarrhea of watery, yellowish-white material. No food taken. April 17, 18, 19: Bird gradually grew weaker. Eyes became watery and were kept closed most of time. Temperature 108°F . April 20: Eyes closed most of time. No food taken and apparently a diminished thirst. Diarrhea. Temperature 107°F . Bird experienced some difficulty in breathing. April 21: Eyes sealed nearly shut, slight discharge from nostrils and bird was breathing through mouth part of time. Temperature 106°F . April 22: Bird prostrate. Breathing through mouth, rattling sounds during respiration. Bird died on this date..

Autopsy: Marked emaciation. Organs presented a typical picture of systemic toxemia. Small abscess at site of injection, composed of mycelia and caseous exudate. Small bead-like lesions in various places in the subcutaneous connective tissue, especially on the ventral surface of the body. Two or three small lesions in pharynx, but esophagus and alimentary tract absolutely free. Few small lesions in both lungs, but larynx and trachea were free. The upper portion of the bronchi was slightly affected. Lungs and alimentary tract gave forth typical, foul odors.

Experiment No. 2. April 6, 1922. Adult male bird in good health. This bird was given, intratracheally, a few drops of a concentrated suspension of *Aspergillus fumigatus* spores taken from macerated nodules. For several days the bird appeared normal and ate heartily. April 13: Bird appeared less active than usual, comb slightly darkened, slight rattling sounds during respiration. April 14: Patient showed marked symptoms, comb very dark, some difficulty in breathing, slight diarrhea. Temperature 108°F . April 15: Bird weak, difficult breathing, often gasping for breath. Eyes watery. April 16: Bird nearly prostrate, eyes sealed nearly shut, gasping for breath, diarrhea. Temperature 106°F . April 17: Bird comatose in morning and died during the day.

Autopsy: Marked emaciation; condition of body showed decided toxemia; lungs, trachea and bronchi contained numerous lesions of aspergillosis. Lesions were also fairly numerous

throughout the abdominal air spaces. Abscess just posterior to lungs. Typical, foul odor was present.

Experiment No. 3. April 6, 1922. Adult female bird in good health. Bird given, by mouth, large numbers of *Aspergillus fumigatus* spores from macerated lesions. This bird was normal and active and had a good appetite for several days. April 15: Comb slightly darkened at edges and bird showed less activity than usual. April 16: Symptoms marked, comb dark, droopy, feathers ruffled. Apparently no appetite but considerable thirst. Small lesions in esophagus and pharynx. Temperature $107\frac{1}{2}^{\circ}\text{F}$. April 17, 18, and 19: Gradually grew worse, diarrhea, eyes watery. Temperature $107\frac{1}{2}^{\circ}$ to 108°F . April 20. One eye sealed nearly shut. Bird prostrate. Slight discharge from nostrils. April 21: Bird nearly dead. Both eyes sealed shut, discharge from nostrils, rattling sounds from lungs. April 22: Bird dead.

Autopsy: Extreme emaciation. Numerous lesions in mouth, pharynx, esophagus, crop, proventriculus, and a few in both small and large intestines. Larynx, glottis and trachea were absolutely free from lesions. One lung contained a cheesy mass of mycelia, spores and some pus. No lesions in any other part of body. Alimentary tract and lungs gave forth typical foul odor. Typical picture of toxemia.

Experiment No. 4. April 14, 1922. Female bird in good health. This bird was given, subcutaneously, a 10-cc suspension of *Aspergillus fumigatus* spores in physiological salt solution. These spores were taken from a culture grown on beer-wort agar. The medium in this case was inoculated from lesions of affected birds. This bird remained in good health until the evening of April 22, when it appeared slightly droopy. On April 23, the condition of the bird appeared more droopy. From this time on the symptoms became more pronounced and the bird gradually weakened until its death, on May 3. The symptoms and autopsy revealed practically the same findings as recorded in experiment No. 1.

Experiment No. 5. April 14, 1922. Healthy female bird. This bird was caused to inhale *Aspergillus fumigatus* spores from cultures, and also had large numbers of spores introduced into the larynx. The cultures were made from lesions and grown on beer-wort agar. No symptoms were noticed for some days and bird was active until April 23, when she showed less activity than normal. On April 24 symptoms were marked and the condition

gradually became more grave until May 1, when death came. The symptoms and autopsy were similar to those recorded in experiment No. 2, except that the air spaces of the abdomen, bones and connective tissues were somewhat more involved.

Experiment No. 6. April 14, 1922. Female bird in good health. Large quantities of *Aspergillus fumigatus* spores from cultures were introduced into the mouth and esophagus of this bird. The cultures were made from lesions and grown on beer-wort agar. April 25: Subject showed a slight decrease in appetite and was not so active as usual. April 26: Slightly droopy and a diminished appetite, with considerable thirst. Comb somewhat darkened. April 27: Symptoms marked and bird gradually became weaker and more inactive, until May 7, when it died. Symptoms and autopsy were comparable to those of experiment No. 3, except that the condition seemed less acute during the earlier stages. The lungs and air spaces were somewhat more involved than where the spores were given in suspension.

Experiment No. 7. May 1, 1922. Female bird in good condition. Large numbers of spores from cultures of *Aspergillus fumigatus* were given into the trachea. Cultures made from moldy grain, such as had been fed to the birds. This did not develop into an acute case. Symptoms did not appear until May 11, and then they were only slight. This condition lingered until May 22, before the bird died. There was great emaciation and only the lungs and air spaces were involved.

Experiment No. 8. May 1, 1922. Female bird in good health. Suspension of spores grown from grain or media were given subcutaneously. Abscess developed at site of injection. Bird became highly emaciated and was finally killed. At autopsy lesions of aspergillosis were found in the subcutaneous spaces but in no other tissues.

Experiment No. 9. May 1, 1922. Female bird. Given large numbers of spores from cultures of *Aspergillus fumigatus* by forcing them into the esophagus. The cultures were made from the grain. The result was negative.

Experiment No. 10. Birds used in the following experiment were in good health, taken from a free range, where they had plenty of green feed, and given a diet with a comparatively low percentage of protein. May 3, 1922: Given intratracheally a few drops of a concentrated suspension of spores taken from lesions of affected birds. May 12: Bird showed some indications of droopiness, took food, but comb slightly dark. Case did not

become acute until May 16. Bird gradually grew weaker and died on May 22. Condition similar to those recorded for experiments Nos. 2 and 5.

Experiment No. 11. May 3, 1922. Vigorous female bird. Given subcutaneously a suspension of spores from lesions of affected birds. May 13: Slight symptoms noticeable. Condition did not become acute until May 18 and the bird died on May 24.

Experiment No. 12. May 3, 1922. Female bird. Given orally a mass of spores from macerated lesions of affected birds. The result was negative.

Numerous experiments have been conducted where *Aspergillus fumigatus* spores have been cultured from grain and tested orally, intratracheally and subcutaneously, on strong, vigorous birds, taken from free range, where they have had plenty of exercise and were given a diet with a low, or reasonably high, protein content. In some instances where the inoculations have been repeated, at intervals of two or three days, mild cases could be developed. In most of the cases the results were negative. Birds that have a low vitality and a weakened resistance soon develop toxemia after repeated inoculations.

DISCUSSION

From the foregoing experiments it is evident that the spores of *Aspergillus fumigatus* are not highly virulent. In fact it seems that they are not particularly pathogenic except under certain conditions where the resistance is decidedly lowered. Birds that are allowed free range naturally have greater vitality and consequently greater resistance to various types of disease than birds that are fed on a high percentage protein diet without sufficient range and exercise. A highly concentrated protein diet, without exercise, would tend to overtax certain organs of the body and at the same time it would undoubtedly have a tendency to produce an acidosis. At any rate the bird's body becomes weakened and the resistance to disease is lowered, on account of the nutritional condition that is produced by such a diet.

In each case where aspergillosis became an epizootic the birds were confined to small pens that were not well kept and the litter was damp and moldy. They were all given a bran mash ration, consisting of 25% to 30% of tankage or meat meal. None of the birds had much of an opportunity to exercise by scratching, as the litter was very limited in amount. The scratch grain that was fed was also very moldy.

The fungus may be found everywhere on grain and on straw, but it causes no trouble until it finds favorable conditions in the animal's body. Gray (1913:1208) states that "once it has thriven in the animal body it becomes more virulent and then it is easy for it to be transmitted from animal to animal, especially of the same species, as from bird to bird." In the above epizootic the condition of the birds was such that their bodies made favorable conditions for the fungus. The birds were weakened from their high protein ration, with a lack of free range, no green feed and insufficient exercise. *Aspergillus fumigatus* spores found favorable conditions for growth in the birds, and thus their virulence was increased by transmission from one host to another.

SUMMARY

1. An epidemic of aspergillosis was prevalent in the flocks of poultry raisers in the vicinity of Stillwater, Oklahoma, in the spring of 1922.

2. The predisposing causes are a lowered vitality and weakened resistance from some cause or other. In this instance the primary cause was due to the nutritional condition of the birds, in addition to having been fed moldy feed, in closely confined pens.

3. Treatment is of no value after the birds once show symptoms. Prevention lies in allowing free range, plenty of green feed and clean pens and feed.

4. *Aspergillus fumigatus* grows very readily on bread, potato and beer-wort agar.

5. Experiments show that the fungus is not particularly pathogenic in healthy, active birds, but that once it finds suitable conditions for growth its virulence increases.

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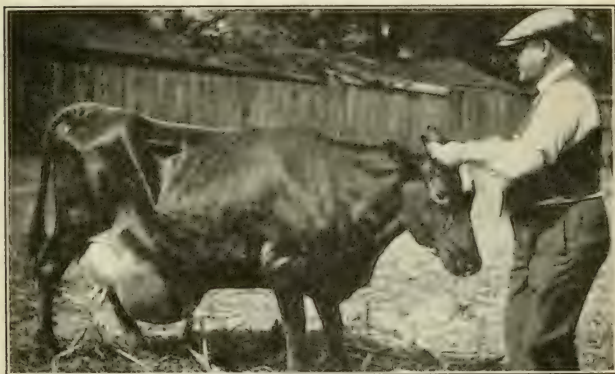
(Practitioners and others are invited to contribute to this department reports of unusual and interesting cases which may be helpful to others in the profession.)

VENTRAL HERNIA AND PERITONITIS

By E. D. KING, JR., Valdosta, Ga.

The urgent need of systematic meat inspection in all cities and localities, to protect public health, is strikingly shown in the following case. Such cases as this should be thoroughly explained to the general public.

A cow showed hernia two days before calving, and the owner called the writer to see it. Later Dr. W. C. Stroud and Dr. E. R. Coon were called in consultation and they agreed that the trouble was a ventral hernia. (Dr. Stroud is Assistant State Veterin-



VENTRAL HERNIA

arian here, and Dr. Coon is a Veterinary Inspector for the Bureau of Animal Industry and was here testing cattle in herds working for admission to the Accredited Herd List.)

Autopsy showed the intestines adhered together by a thick, straw-colored, gelatinous, blood-streaked substance, and the serosa showed plain lesions of peritonitis, both in the protruding mass and in the viscera remaining in the abdominal cavity. Petechiae on pleura and peritoneum were fairly numerous.

A detailed description of the lesions seems unnecessary, but the reader is referred to Edelmänn's *Meat Hygiene* (translated by Mohler and Eichhorn), p. 301, under Judgment: "As the toxalbumens of septicemia bacteria are not positively destroyed by heat, the use of meat, even in cooked condition, is not permitted."

The diagnosis was "peritonitis" with a very probable complication of septicemia, and being unable to obtain consultation at the time of slaughter, the carcass was condemned without opportunity to have other opinion than mine.

This seems to be of special interest to the profession, in that it presents a case, seemingly fit for food to the untrained person, but very probably dangerous to the extent of causing death, and unquestionably capable of producing sickness, even in the cooked state. Inquiry revealed the fact that more than thirty days elapsed between the date of the injury and time of slaughter.

Have You Secured One New Member This Year?

MAJOR SURGICAL OPERATION ON A PARROT

By J. RAYMOND WELLS, Boston, Mass.

Angell Memorial Animal Hospital

A current periodical recently published an extensive article upon medical and surgical therapeutics applied to parrots. Concerning the surgery it stated that major operations were not feasible. This has not been the experience at the Angell Memorial Animal Hospital in Boston. A great many birds are examined and treated by our staff, and a considerable number of these are parrots. We have performed numerous minor, and a few major, operations upon them, so for the benefit of those small animal practitioners, who are surgically inclined, and for the interest of those who do not know that such radical measures are attempted upon birds, we will report the case of a ten-year-old parrot operated upon for prolapse of the cloaca.

From the history we learned that the condition first appeared one year previous to the time this study was started and that administration of an elixir of iron, quinine, and strychnine had toned up the organ sufficiently to overcome the trouble. The recrudescence was first noticed two months prior to our examination. Though the cloaca was completely everted, the bird maintained a good appetite.

First, we endeavored to treat the condition medically. After replacement, a purse-string suture was inserted and styptic suppositories of tannic acid were used several times a day. In addition, an elixir of iron, quinine and strychnine was again tried, being given in twenty-minim doses three times a day. When ten days had elapsed, the suture was removed, but by the following morning the procdence had recurred. Since drugs, then, were found ineffectual, surgery was resorted to.

The patient was restrained by means of a heavy towel. An ether cone was placed entirely over its head, and in a short time (perhaps two minutes) anaesthesia was established and relaxation complete. Very little ether was required to maintain this state. The feathers were plucked from the right and left lumbar and iliac regions of the abdomen, the areas washed, then bathed with ether to remove all quill oil, and antisepticized with a diluted solution of iodine. Two two-inch incisions through skin, musculature and peritoneum were made diagonally from the costo-chondral junction of the last ribs toward the corresponding sides of the vent. The prolapse was reduced and with catgut sutures two areas of the cloacal peritoneum were bound to the parietal peritoneum.

Interrupted sutures of catgut were placed in the external incisions, a dressing of antiseptic drying powder was applied, and about fifteen turns of bandage were wrapped around the parrot's body. These layers were sealed together and stiffened with sodium silicate, and six thicknesses of heavy paper were applied in a shield-like fashion over the entire abdominal expanse of the bandage. This seemingly great amount of material was used in order that the wounds would have time to heal before the bird could pick off the covering. The means was effective, for every knot had fallen away before the parrot removed the bandage.

By suturing the cloaca to the belly wall at two places, in a transverse line, a comparatively long transverse adhesion was produced. This union made further prolapse impossible. Catgut sutures were used in the incisions because by previous experience the operator had learned that the struggle attending the removal of silk sutures was sufficient to break down the peritoneal adhesion. Administration of tincture of nux vomica, 2 minims, in elixir of lactated pepsin, 20 minims, three times a day, soon restored a normal appetite. The diet consisted of apple meat, orange pulp, and bread in milk. At the end of three weeks small

amounts of seed were offered, and at six weeks the normal ration was being fed.

This operation, while of no economic value, is interesting, since it shows that good results can be obtained in major surgery upon parrots.

We Want 5000 Members This Year.

HEMORRHAGIC SEPTICEMIA IN MULES¹

By H. R. CHURCH, Harrisburg, Pa., and

E. L. STUBBS, Philadelphia, Pa.

During the latter part of December, 1922, there occurred an outbreak of hemorrhagic septicemia in mules which is considered of sufficient interest to report.

About eighteen months previously, the owner had purchased twenty head of mules, ranging in age from yearlings to three-year-olds. These mules were in pasture during the summer with the exception of one or two of the oldest ones, which were used on the owner's farm. The last week in October they were placed in a barn with access to the barnyard and a portion of the basement barn. After being taken up from pasture they were fed corn fodder and ear corn, until the first of December, when in addition they were given alfalfa and timothy hay. On December 6th the owner hitched one of the mules with an aged horse and drove about two miles. Nothing was noticed wrong with this team when placed in the stable and they ate their evening meal. The next morning these two animals were found dead. They were sent to the fertilizer works.

On the morning of the 9th the owner found another mule sick and immediately called a veterinarian who diagnosed the case as inflammation of the bowels. This mule died that evening. On December 12th two more mules were taken sick and another veterinarian was called, who diagnosed the trouble as influenza. These two mules lived less than twenty-four hours. On December 17th two more mules were taken sick. The Bureau of Animal Industry was called on the 18th and a visit was made on that day at 2 p.m. when it was found that one mule had died and another was sick. Both sick mules had high temperatures, one being

¹Contribution from the Bureau of Animal Industry, Pennsylvania Department of Agriculture. New Series No. 14.

105.6° F. and the other 106.2° F. Visible mucous membranes were injected, pulse very weak, almost imperceptible. The mules walked with a staggering gait and would not remain in a standing position very long at a time. However, the tendency to lie down did not seem to be caused by pain but rather by weakness. The ears lopped and the bowels were relaxed.

Autopsy of the mule which had died a few hours previously showed extensive hemorrhagic areas throughout the entire muscular system. The pharynx, larynx, trachea, pleura and lungs showed rather profuse petechiae. There were no diffuse hemorrhagic areas in the lung tissue. The muscular walls of the intestines and the peritoneum showed extensive hemorrhagic areas, as did the liver, stomach, spleen, kidneys and bladder. There was quite a profuse gelatinous exudate around the liver and spleen and also in the muscles. A diagnosis of hemorrhagic septicemia was made. The remaining mules were vaccinated.

Specimens were submitted to the laboratory consisting of the heart, a portion of the liver and of the spleen. The heart showed hemorrhages on both the epicardium and endocardium, varying from petechiae to suffusions. These hemorrhages were bright red in color. The liver was friable, the spleen was slightly swollen and on cut section was very dark red in color. Smears of the heart-blood and spleen showed large numbers of bacilli with bipolar staining. An emulsion was plated on blood agar and 2 cc injected subcutaneously into two rabbits. In twenty-four hours, on the plates, there was a pure culture of a bacillus characteristic of the hemorrhagic septicemia group. The rabbits failed to die. We have been unable to get this culture to grow on plain agar but it grows well in bouillon and on blood agar.

Hardenbergh and Boerner, writing on hemorrhagic septicemia in mules, in the *JOURNAL OF AMERICAN VETERINARY MEDICAL ASSOCIATION* (Sept. 1917, p. 817), also refer to the difficulty of getting bipolar organisms to grow when isolated from mules and of their failure to kill rabbits on inoculation. This culture was again injected into rabbits, guinea pigs and white mice but was non-pathogenic.

REVIEWS

SPEZIELLE PATHOLOGISCHE ANATOMIE DER HAUSTIERE. (Special Pathological Anatomy of the Domestic Animals). Ernst Joest, D. M. V., Ph. D., Professor of Pathological Anatomy in the Veterinary High School of Dresden. Vol. III, 1st half. 410 pages, 188 illustrations. Published by Richard Schoetz, Berlin, 1923.

This work represents the third volume, first half, with the joint authorship of Acherknecht and Frei of Zurich, Henschen of Stockholm, Hieronymi, Nieberle, Noller, Schlegel, Trautmann, Ziegler, Zumpe and Joest, Editor-in-Chief, of Germany. The subject matter is confined to a discussion of the glands of internal secretion, male sex organs, and urinary apparatus.

The chapter on the Endocrine System (XII) is written by Trautmann, of Dresden, who gives a description of the endocrine system. The paragraph topics are made prominent, as are some of the sentence subjects, by heavy type. The literature consulted is appended at the end of each article. The discussion is arranged under macroscopical, developmental and microscopical divisions: first, dealing with normal anatomy; second, with the physiology and pathologic physiology; and third, with structural pathology. The chapter treats with the pathologic conditions as found in the thyroid, parathyroid, adrenal, pituitary, pineal and thymus glands. The discussion consumes 129 pages. The subjects are treated thoroughly and are fairly well illustrated.

Chapter XIII, written by Schlegel, concerns the pathology of the male reproductive organs. The same schema is followed in its development. The subject matter is thorough, but in many instances illustrations are scanty, especially microscopical reproductions supplementing the macroscopic, which would lend a finish, especially desired by students of the subject. The chapter includes 60 pages.

Chapter XIV, by Henschen, of Stockholm, includes a complete discussion of the pathology of the urinary organs. The chapter concludes the volume and consumes 219 pages. Illustrations are ample and excellent, the subject matter very well composed and well classified. The work presents the modern views of pathologists, concerning especially the pathology and classification of nephritis. The development of the subject is similar to that described for the Endocrine System.

As with the volumes which preceded this one, the discussions are not limited to any one of the domestic animals. Consideration of the pathology of the domesticated forms is dealt with in a comparative way.

This volume is a worthy supplement to the two volumes which came before. There is nothing in the English language with which to compare it and probably no book its equal has ever been presented to the profession, in an accessible language. The book is most highly commended to all interested in the development of comparative pathology.

D. C. B.

TUBERCLE BACILLUS INFECTION AND TUBERCULOSIS IN MAN AND ANIMALS. Albert Calmette, Associate Director, Pasteur Institute, Paris. Authorized translation by Willard B. Soper, M. D. and George H. Smith, Ph. D. Second edition. 714 pages with 31 figures in the text and 25 full-page colored plates. Indexed. Published by Williams and Wilkins Company, Baltimore, 1923. Price \$8.00, cloth.

Undoubtedly the best work on the subject of tuberculosis that has ever been written. It is complete, without being tedious, even to the slightest degree. The author has sifted, from the voluminous literature on the subject of tuberculosis, all that is sound and serviceable in the campaign against the most terrible of human infectious diseases, and has intentionally omitted all discussion of doctrines or of theories.

It is refreshing to read in the preface that the author addresses his book to the veterinarian, as well as to the physician and the laboratory worker. The veterinarian, as a comparative pathologist, will find every chapter teeming with valuable information. Some chapters are devoted entirely to a discussion of tuberculosis in animals, both wild and domestic.

The book is divided into four parts: (1) The Tubercle Bacillus and Processes of Infection by It, Chapters I to XIX; (2) Experimental Tuberculosis and Tubercle Bacillus Infection in Animals, Chapters XX to XXIX; (3) Processes of Defense and the Diagnosis of Tuberculous Infection, Chapters XXX to XXXVII; (4) Natural Immunity and Processes of Immunization Against Tuberculous Infection, Chapters XXXVIII to XLIV.

Parts 2 and 3 undoubtedly offer the most interesting material for the veterinarian. Among the subjects discussed are:—Dif-

ferent modes of inoculation and of experimental infection. Differential characters of the bovine and human types of tubercle bacillus. The pathological anatomy of bovine tuberculosis. Frequency and geographical distribution of the disease in cattle. The role of bovine tuberculosis in the infection of man. Specific diagnostic reactions. Mechanism of tuberculin reactions. Variations in virulence of the tubercle bacillus. Natural immunity. Protective vaccination. Chemotherapy of tuberculosis.

In the chapter on chemotherapy the author very frankly concludes that it must be recognized, that up to the present time, despite the great amount of effort that has been put forth, in the hope of finding a chemical agent capable of arresting the development of tuberculosis in experiment animals, those attempts have been in vain. The author is not discouraged, however, and points out the necessity for continuing these studies. He warns against the uselessness of misdirected efforts and states that methodically conducted experimentation upon animals sensitive to tuberculosis will enable us to explore with profit the immense perspectives offered by chemotherapy.

One feature of the book is worthy of special mention—the colored plates. These are magnificent examples of the art. No more faithful reproduction of the natural colors is ever seen, especially in the plates depicting lesions in the various viscera, and the cutaneous tuberculin reactions. Those showing the cultivation of tubercle bacilli on various artificial media are unusually good.

In this book are combined the efforts of a brilliant scientist, a talented illustrator, careful translators and skilled printers. They have every reason to be proud of what they have accomplished.

ABSTRACTS

INVESTIGATIONS INTO BRAXY. S. H. Gaiger. Jour. Comp. Path. and Thera., xxxv, (1922), 191; 235.

The article deals principally with the etiology, pathology and methods of prevention of a disease of sheep in Scotland. The disease is seasonal and principally attacks sheep from October to January. The writer concludes that certain circumstances cause injury to the mucous membrane of the fourth stomach, enabling an anaerobic bacillus to penetrate the mucosa and grow in the deeper structures. The toxin formed lowers the host's

resistance and enables the organism to attack other parts of the alimentary tract and finally reach the peritoneal cavity and enter the blood stream. The bacterial invasion and toxemia soon proves fatal. Sheep succumbed when injected subcutaneously with small quantities of culture, but the same when fed failed to cause appreciable damage.

The writer compared the organism isolated from braxy with cultures obtained from a similar disease in Continental Europe known as bradsot, also with *Vibrio septique*, and found them identical. He was able to distinguish the braxy-bradsot-*Vibrio septique* group from *B. chauvis* and *B. oedematiens*.

Methods of prevention are discussed. Jensen developed a sero-vaccine against bradsot which proved effective as a preventive of braxy in Gaiger's observations during 1921-22. Trials were made with a germ-free filtrate of culture. Two subcutaneous injections of 5 cc of filtrate gave encouraging results as a preventive.

F. S. J.

JOINT-ILL IN FOALS. J. M'Fadyean and A. L. Sheather.
Jour. Comp. Path. and Thera., xxxvi, (1923), 22.

The vaccine was prepared from six strains of streptococci, four isolated from involved joints, one from an umbilicus, and one from an abscess in the brain. Each strain was grown in dextrose-serum broth. After heating at 56°C., phenol was added in the proportion of 0.5 percent. The growth was permitted to sediment. The sediments of all cultures were mixed and standardized by dilution.

The plan was to administer the vaccine to mares a month before parturition and a further treatment 2 weeks later. The foals were to be injected as soon after birth as possible, a second dose to be given 2 weeks later.

In all, a total of 1007 foals were treated. Of these 64, or 6.3 percent, developed joint-ill, and 38, or 3.7 percent, died.

The writers compared their results with the mortality records of two insurance companies. The statistical evidence obtained from these records indicated an average annual mortality of 2.5 percent for one company, and for the other an average of 2.8 percent. On this comparison and further evidence M'Fadyean and Sheather conclude:

1. The mortality from joint-ill, and probably also the inci-

dence of the disease, varies from year to year. In this country (Great Britain) it appears to average 3 percent.

2. The normal case mortality appears to be about 55 percent.

3. Treatment of either mares or foals, or both, with anti-streptococcus serum, or vaccine of killed streptococci, has no effect either in preventing joint-ill or in curing it, and it ought therefore to be abandoned.

4. Prophylactic measures should be based on the view: (1) that the disease is contracted by the foal after birth; (2) that the streptococci and other organisms concerned in its production are widely distributed facultative parasites, frequently present in soil and dirt; and (3) that the umbilical cord is the usual starting point of the disease.

F. S. J.

ARSENICAL COMPOUNDS IN THE TREATMENT OF BLACKHEAD IN TURKEYS. Ernest Edward Tyzzer. Jour. Exp. Med., xxxvii, (1923), pp. 851-873.

In previous investigations the author was able to show that none of the following were of value against blackhead: *Chaparro amargoso*, tartar emetic, quinine hydrochloride, emetine hydrochloride and ipecac.

The present study had to do with the effects of neoarsphenamine, arsenious acid, atoxyl, and tryparsamide. The first three were found unfavorable, either on account of their toxicity or failure to be of utility against blackhead, but tryparsamide gave good results. In Tyzzer's experiments one dose of from 4 to 22 cc of a 25% solution (or up to 1 gm. per kilo of body-weight) was injected, the usual results being improvement or cure.

In order to effect a cure, however, it is necessary to institute treatment before the disease has become so thoroughly established.

Tyzzer concludes: "Tryparsamide has the most pronounced curative action on blackhead infection of any of the drugs thus far tested. Either intravenous or subcutaneous injection of appropriate doses of this drug at the first appearance of symptoms should serve to cure the majority of cases of blackhead."

F. B.

AMERICAN VETERINARY MEDICAL ASSOCIATION
Proceedings of Fifty-ninth Annual Meeting, St. Louis, Mo.
August 28 to September 1, 1922

(Concluded)

SECTION ON GENERAL PRACTICE
TUESDAY MORNING, AUGUST 29, 1922

The first session of the Section on General Practice convened at 9:45 a. m., Dr. W. E. Muldoon, of Manhattan, Kansas, presiding.

CHAIRMAN MULDOON: The first thing on the program is the Chairman's address. I have no address to make. The only thing I want to say is that this is supposed to be a practitioners' meeting and we hope that you will discuss these papers thoroughly.

The first paper on the program is, "The Handling of Fistula of the Withers in Practice," by Dr. B. W. Conrad, of Sabetha, Kansas.

Dr. Conrad presented his prepared manuscript. (Paper published in JOURNAL, October, 1922, pp. 37-38. Discussion published in JOURNAL, November, 1922, pp. 207-208.)

CHAIRMAN MULDOON: Any further discussion? If there is no further discussion, the next paper on the program is to be a paper by Dr. Boyd on "Pathology of Sterility." As he is unable to get a lantern right now we will ask Dr. Frick to read his paper on "The Acriflavine and Proflavine Preparations in Bovine Practice."

Dr. E. J. Frick, of Manhattan, Kansas, read his prepared manuscript. (Published in JOURNAL, October, 1922, pp. 34-36.)

CHAIRMAN MULDOON: You have all heard Dr. Frick's paper. Is there any discussion? If not, we have a lantern now, that I think will work, and I believe we will have Dr. Boyd's paper at this time. (Dr. Boyd then delivered an illustrated lecture on "The Pathology of Sterility in Cattle," which is published in this issue of the JOURNAL.)

. . . The meeting adjourned at 12:15 p. m.

FRIDAY MORNING, SEPTEMBER 1, 1922

The meeting convened at 8:45 a. m., Dr. H. E. Kingman presiding.

CHAIRMAN KINGMAN: It is rather embarrassing to start the

program with such a small attendance, but we will get that much more out of it.

The first paper on the program this morning will be by Dr. J. G. Ferneyhough, of Richmond, Virginia, on "Why the Practicing Veterinarians Should be Recognized and Appreciated by the State and Federal Officials." (Dr. Ferneyhough read his paper. Published in the JOURNAL, January, 1923, pp. 481-483.)

CHAIRMAN KINGMAN: The next order of business, gentlemen, according to this program, is the election of officers for this section. Is there any business that should come up before we take up the matter of election of officers?

DR. FERGUSON: Mr. Chairman, it has always been our custom in this section to nominate and elect the present Secretary of this section as President. Therefore, I take pleasure in placing the name of Dr. Kingman in nomination for that office.

CHAIRMAN KINGMAN: Any other nominations?

DR. A. TRICKETT (Kansas City, Mo.): I move that the nominations be closed.

The motion was seconded by Dr. Ferguson and carried.

CHAIRMAN KINGMAN: Nominations are now in order for Secretary of the section.

DR. CONRAD: I would like to place in nomination, and it gives me great pleasure to mention the name of Dr. Ferguson, for Secretary of this section.

DR. FERGUSON: I appreciate the honor alright, but I have served on this section a great many times and I would not like to be up too often. I do, however, take pleasure in nominating Dr. Harry Caldwell, of Wheaton, Ill. Dr. Caldwell is a practitioner of several years' experience; he is one of the coming practitioners of the country, and I can assure you he will make a first-class Secretary of this section in every way.

CHAIRMAN KINGMAN: I think Dr. Ferguson is sincere in his remarks, and if it is his choice, Dr. Conrad, would you withdraw your nomination?

DR. CONRAD: Yes.

DR. TRICKETT: Mr. Chairman, I move you that the rules be suspended and Dr. Caldwell be given the unanimous vote of this body. The motion was seconded and carried.

CHAIRMAN KINGMAN: I believe that this concludes our program for this morning. Thank you.

The meeting adjourned at 9:20 a. m.

ADJOURNMENT.

OTHER MEETINGS

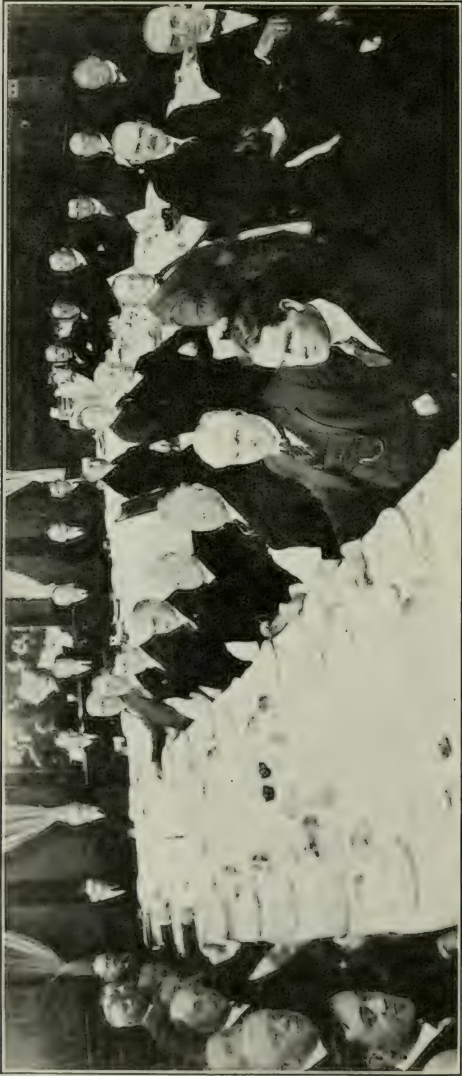
MASSACHUSETTS VETERINARY MEDICAL ASSOCIATION

The thirty-ninth annual meeting of the Massachusetts Veterinary Medical Association was held at Young's Hotel, Boston, April 25, 1923, forty-three members being present.

The meeting was called to order by President Gilbert at 6:15 p. m. The minutes of the March meeting were read. President Gilbert reported the appointment of the committee to act with Dr. Clark, relative to the advisability or the establishment of a veterinary school at Amherst, Mass. Drs. Lentz, Playdon, Cleaves and C. H. Paquin were appointed. Dr. Mulverhill, for the Committee on the Writing of Prescriptions for Alcoholic Liquors, reported that the matter was being given the attention of the Committee and a report would be made later. The Secretary-Treasurer then presented his financial report for the year 1922-23. The Secretary also made a report relative to membership.

The following officers were elected for the ensuing year: President, Dr. W. L. Thayer; First Vice-President, Dr. William Buckley; Second Vice-President, Dr. H. N. Eames; Secretary-Treasurer, Dr. C. H. Playdon. President Gilbert in a few well chosen remarks turned the chair over to the incoming President, Dr. W. L. Thayer. Dr. Gilbert moved that a vote of thanks be extended to Dr. H. W. Peirce, for his faithful services as Secretary during the past five years, and that the report be accepted, which motion was unanimously carried.

Dr. Babson, under new business, called the attention of the Association to the luncheon and dinner to be held at Springfield, on April 26th, at which the following associations were to be present: Massachusetts Association of Boards of Health, Massachusetts Medical Association, Massachusetts Tuberculosis League, Massachusetts Association of District Nurses, etc. Dr. Babson referred to the fact that the Massachusetts Veterinary Medical Association should be represented at this meeting. It was moved and passed that a committee of three be appointed to bring to the attention of this conference the fact that the Massachusetts Veterinary Medical Association was overlooked by no invitation having been extended. Dr. H. W. Peirce moved



Banquet, Annual Meeting Massachusetts State Veterinary Medical Association, Young's Hotel, Boston, Mass., April 25, 1923.

that the Secretary be instructed to have the new Constitution and by-laws printed, but that the expense be limited to thirty dollars.

Motion made by Dr. T. E. Maloney that the by-laws be suspended and that the regular May meeting be held at Amherst, on the third Wednesday of the month.

Dr. L. A. Paquin moved that a vote of thanks be extended to Dr. L. H. Howard, Director of Animal Industry, for the use of his office for the March meeting. Dr. Howard accepted the vote of thanks and extended an invitation to the Association to meet at his office at any time it was deemed advisable by the Association.

Dr. H. W. Peirce, as Custodian, reported the condition of the fund remaining from the amount collected for the Bovine Tuberculosis Conference of 1921. This report called for considerable discussion and numerous motions were offered, but no definite action was taken. The meeting adjourned, at 7:15, to the Presidential Chamber, where a banquet provided by the Entertainment Committee was enjoyed by all. During the banquet music was furnished by Dr. and Miss Reynolds.

After the banquet a very interesting and instructive talk was given by Professor Allyn, on the subject of "Vitamins as Applied to Animal Health." The lecture was illustrated by blackboard drawings and specimens brought by the Professor. That the subject proved to be interesting was shown by the number of questions which were asked of Professor Allyn at the close of his talk.

Mr. H. C. Robinson, Passenger Traffic Representative of the Grand Trunk Railway, gave a brief talk regarding the rates from different points in Massachusetts, to Montreal, for the August Convention of the American Veterinary Medical Association.

Dr. H. Preston Hoskins, Secretary-Editor of the American Veterinary Medical Association, gave a pleasant and interesting talk relative to A. V. M. A. matters. He called attention to the necessity of all Massachusetts veterinarians becoming members of the National Association.

Meeting adjourned at 11:00 p. m.

C. H. PLAYDON, *Secretary-Treasurer.*

We Want 5000 Members This Year.

VETERINARY MEDICAL ASSOCIATION OF NEW YORK CITY

The regular monthly meeting of the Veterinary Medical Association of New York City was called to order by the President, Dr. J. Elliott Crawford, in the Academy of Medicine, 17 West 43rd St., on Wednesday evening, May 2nd, 1923 at 8:45 p. m.

Dr. H. Preston Hoskins, Secretary-Editor of the American Veterinary Medical Association was present and gave a very interesting talk on the future of the Association. He related many of the trials and amusing features of the position he occupies. A number of questions were asked by members of the Association and all were ably answered by Dr. Hoskins. It was the opinion of those present that the A. V. M. A. has been fortunate in selecting Dr. Hoskins as its Secretary-Editor, and that the JOURNAL has a bright future.

Drs. Chase, Gannett, Way, Ackerman and others joined in the discussions. Dr. T. E. Munce, of Harrisburg, Pa., was present and spoke very favorably of the future of the A. V. M. A.

Dr. Robert S. MacKellar read a paper on "Reminiscences of Practice in Greenwich Village." Dr. MacKellar has been located in the "Village" for a number of years and recalled the many stables in the alleys, with the owner living in the house in front. In many instances the wagons were parked in the street and later in the form along the water front. The veterinarian was given a key to the stable and it was necessary to maintain a key-board in his office, to be able to enter the various stables while the owners were out trucking.

Dr. R. S. MacKellar reported and exhibited several specimens of intestinal calculi. The one, during the treatment of a horse supposedly suffering colic, was removed from the rectum and on cross-section showed a nucleus consisting of a smaller calculus. The other one was passed by the horse while being treated and showed a nucleus of a piece of wire. He also reported and exhibited a urinary calculus he had found in the end of the penis of a horse. These specimens were rather rare and most interesting. The subject was discussed by Drs. Geo. Berns, E. B. Ackerman, Theo. Keller and others.

It was regularly moved and seconded that the President appoint a committee of three, consisting of Drs. W. Reid Blair, Ackerman and Rohrer, to solicit funds for a donation to the building fund of the Academy of Medicine.

On motion a rising vote of thanks was extended Drs. Hoskins and MacKellar for their entertainment.

No further business appearing, the meeting adjourned.

C. G. ROHRER, *Secretary*

Have You Secured One New Member This Year?

FOURTH ANNUAL NEW ENGLAND CONFERENCE

The fourth annual New England Conference on Live Stock Diseases, including Bovine Tuberculosis Control and Eradication, was held in Representatives' Hall, State House, Concord, N. H. on June 12-13, 1923, under the auspices of:—

United States Bureau of Animal Industry,
New Hampshire Veterinary Medical Association,
New Hampshire State Department of Agriculture,
New England Live Stock Sanitary Officials with the
New England Departments of Agriculture and
Veterinary Associations Co-operating.

The Conference was called to order at 9 a.m. sharp, by Dr. R. W. Smith, President of the New Hampshire Veterinary Medical Association, who introduced Hon. A. L. Felker, Commissioner of Agriculture, Concord, N. H., who gave the address of welcome.

Dr. John R. Mohler, Chief of the Bureau of Animal Industry, Washington, D. C., followed Commissioner Felker's address of welcome with an address in which he outlined the object of the conference. Dr. Mohler was followed by live stock officials from the New England States, New York, New Jersey and Pennsylvania, who reported upon the progress of tuberculosis eradication in their respective states. The following speakers were heard:

Dr. J. B. Reidy, Representing the Chief of the Division of Animal Industry, Augusta, Me.

Hon. E. S. Brigham, Commissioner of Agriculture, Montpelier, Vt.

Dr. Lester H. Howard, Director, Division Animal Industry, Boston, Mass.

Hon. J. M. Whittlesey, Commissioner of Domestic Animals, Hartford, Conn.

Hon. D. W. McLaury, Director, Division Animal Industry, Albany, N.Y.

Dr. P. E. Quinn, Representing the State Veterinarian, Harrisburg, Pa.

The afternoon session was opened by Hon. Enos K. Sawyer, Secretary of State, in the absence of His Excellency, Fred H. Brown, Governor of New Hampshire. Then the following speakers addressed the meeting:

Dr. Wm. H. Donnelly, President of American Association of Certified Milk Commissions, "Raw Milk *versus* Pasteurized Milk."

Mr. H. M. Currier, Pelham, N. H.

Prof. H. R. Smith, Live Stock Commissioner, Chicago, Ill.

Mr. Geo. M. Putnam, President, New Hampshire Farm Bureau Federation, Contoocook, N. H.

Prof. J. C. McNutt, University of New Hampshire, Durham, N. H.

Hon. H. N. Sawyer, Master New Hampshire State Grange, Atkinson, N. H.

Hon. A. J. Glover, *Hoard's Dairyman*, Fort Atkinson, Wis.

The evening program consisted of moving pictures and the following addresses:

Dr. J. A. Kiernan, Chief, Tuberculosis Eradication Division, Washington, D. C.

"A Farmerette's Viewpoint of Tuberculosis Eradication," by Miss Elizabeth Farley, Amherst, Mass.

The program for Wednesday was as follows:

"Progress of Co-operative Tuberculosis Eradication, as a National Program," by Drs. A. E. Wight, Asst. Chief, Tuberculosis Eradication Division, Washington, D. C.; J. B. Reidy, Inspector-in-Charge, Augusta, Me.; R. W. Smith, State Veterinarian, Concord, N. H.; and G. E. Corwin, Deputy Commissioner Domestic Animals, Hartford, Conn.

"Salvaging Reactors," by Drs. J. E. Gibson, Indianapolis, Ind.; H. B. Leonard, Inspector-in-Charge, Albany, N. Y.; R. L. Smith, Inspector in Charge, Hartford, Conn.

"Twenty Years Experience in Wisconsin," by Hon. C. P. Norgard.

"Tuberculosis Eradication Work in Canada," by Dr. Orlan Hall, Ottawa, Ont.

"The Veterinary Practitioner, and His Part in Co-operative Tuberculosis Eradication," by Drs. A. T. Gilyard, Waterbury, Conn.; Fay F. Russell, Concord, N. H.; and W. L. Thayer, Worcester, Mass.

"Area Tuberculosis Eradication Work," by Dr. R. C. Julien, State Veterinarian, Indianapolis, Ind.

Discussions on Tuberculosis, by Drs. Harrie W. Peiree, Massachusetts Division of Animal Industry; P. E. Quinn, Inspector-in-Charge, Harrisburg, Pa.; L. H. Adams, Montpelier, Vt.; W. G. Middleton, Inspector-in-Charge, Trenton, N. J.; and A. L. Edmunds, Franklin, N. H.

WEDNESDAY AFTERNOON

"The Work of the Experiment Station on Tuberculosis Eradication," by Dr. E. C. Schroeder, Superintendent, Experiment Station, Washington, D. C.

"Bovine Tuberculosis Eradication, from a Public Health Viewpoint," by Dr. Wm. M. Stockwell, Superintendent, State Tuberculosis Sanatorium, Hartford, Conn.

"The Importance of Clean Milk in Public Schools," by Dr. Thomas F. Kenney, Director, Board of Health, Worcester, Mass.

"Tuberculosis in the Home," by Dr. Kerr, Manchester, N. H.

"The High Spots of the Conference," by Dr. John R. Mohler, Washington, D. C.

Wednesday evening a banquet was held at the Eagle Hotel, followed by a dancing party, at the Parish House.

The committee appointed to entertain the visiting ladies included: Mrs. R. W. Smith, Laconia, N. H., Mrs. Fay F. Russell, Concord, N. H., Mrs. H. M. Lewis, Nashua, N. H., Mrs. H. S. Perley, Hanover, N. H., Mrs. A. L. Edmunds, Franklin, N. H. and Mrs. Guy E. Chesley, Rochester, N. H.

Tuesday, a trip to the Weirs, lunch at the Laconia Country Club, a steamer ride on Lake Winnepesaukee, and back home in time for the evening program. On Wednesday the ladies motored through the White Mountains, and to places of interest, in and about Concord.

Besides the speakers on the program, many prominent men of the profession were present, including Drs. A. E. Moore, Montreal, Que.; T. H. S. Lowrey and E. A. Watson of Ottawa, Ont.; J. G. Wills, Albany, N. Y.; John F. DeVine, Goshen, N. Y.; Otto Faust, Poughkeepsie, N. Y.; Benj. D. Pierce, Springfield, Mass.; M. E. Maddocks, Augusta, Me.; L. E. Maddocks, Gardner, Me.; J. S. Henderson, Memphis, Tenn., and many others.

A great deal of credit is due Dr. E. A. Crossman, of Boston, for his active part in making the Conference a decided success.

FAY F. RUSSELL, *Res. Sec. (A.V.M.A.) for N.H.*

CENTRAL NEW YORK VETERINARY MEDICAL ASSOCIATION

The fourteenth annual meeting of the Central New York Veterinary Medical Association was held at Syracuse, N. Y., June 14, 1923. The meeting was opened at 9:30 a. m. with a clinic at the Infirmary of Dr. J. A. Pendergast.

The following cases were operated upon:

- Case 1. Fistula of the maxillary sinus of dog.
Surgeons: Drs. Hollingworth and Currie.
- Case 2. Fistula of the withers. Chestnut mare.
Surgeons: Drs. Stack, Long and Sullivan.
- Case 3. Trimming ears. Bull terrier.
Surgeon: Dr. Currie.
- Case 4. Abscess on abdomen. Brown mare. Removed a piece of wire.
Surgeons: Drs. Stack and Long.
- Case 5. Spaying. Cat.
Surgeon: Dr. J. A. Pendergast.
- Case 6. Quittor. Brown mare.
Surgeons: Drs. Currie and Long.
- Case 7. Roarer. Sorrel gelding.
Surgeons: Drs. Danforth and Long.

This case ended another of our very interesting clinics. At 2 p. m. we adjourned to the St. Cloud Hotel, for the regular annual business meeting. Dr. J. K. Bosshart, President, took the chair and called the meeting to order.

First in order were the annual reports of the officers, covering a period of two years, as we had skipped one annual meeting, on account of the 1922 State Association meeting, held in Syracuse. The reports of the officers were accepted and placed on file.

Roll-call showed the following members present: Drs. D. A. Boardman, F. N. Burk, L. P. Crow, G. W. Derrick, E. E. Dooling, W. G. Hollingworth, W. M. Long, L. G. Moore, J. C. Stevens, W. M. Sullivan, A. J. Tuxill, J. K. Bosshart, E. E. Cole, J. M. Currie, A. L. Danforth, R. C. Hartman, J. B. Knapp, Frank Morrow, J. A. Pendergast, J. H. Stack, W. B. Switzer. Guest: Dr. Joseph Turner, Lyons, N. Y.

The election of officers resulted as follows: Dr. A. L. Danforth, President; Dr. J. H. Stack, Vice-President; Dr. W. B. Switzer, Secretary-Treasurer.

It was voted that a committee be appointed by the President,

to retire at once and bring in some resolution in regard to a suggestion made by Dr. Danforth, that this Association have the power to hold the semi-annual meeting in some other place than Syracuse, at the option of the Association, and by a vote taken at the annual meeting preceding each semi-annual meeting.

The President appointed the following committee: Drs. A. J. Tuxhill, E. E. Dooling, J. A. Pendergast and J. M. Currie. After due consideration they brought in such a resolution, recommending that this Association have the power, by a majority vote, at any annual meeting, to hold the following semi-annual meeting at some place other than Syracuse.

A vote was taken and the report of the committee was accepted. The Secretary was instructed to send out notices prior to the November meeting, to all members, informing them that said resolution would be voted upon at the meeting in November 1923, and if carried, the by-laws will stand amended to that effect.

Dr. A. L. Danforth gave a very interesting paper on "Business Principles as Applied to the Veterinary Profession." Dr. W. G. Hollingworth followed with a talk on "Success," and illustrated his talk with a number of fine charts, showing that he had spent a large amount of work on the same.

Dr. Currie gave a very instructive paper entitled "Odds and Ends," consisting of case reports. This was followed by case reports by Dr. Boardman. These, with the discussions that followed, made a very interesting and instructive meeting.

Drs. D. H. Udall, J. B. Knapp and J. C. Stevens were appointed on the Red Cross Committee.

Before adjourning Dr. Tuxill made a motion, which was duly seconded, that each officer elected at any annual meeting serve to the close of the following meeting, instead of being seated at the time of election. This motion was unanimously carried.

Thus closed one of our very best meetings and adjournment was taken.

W. B. SWITZER, *Secretary.*

Does Your Wife Know About The Women's Auxiliary?

TEXAS STATE VETERINARY MEDICAL ASSOCIATION

A very successful, two-day meeting was held at Dallas, June 20-21, 1923. About 125 graduate veterinarians and their wives, as well as a number of visitors, were in attendance.

The session opened at the Jefferson Hotel, with an address of welcome by County Attorney J. J. Collins, and was responded to by Dr. N. F. Williams, of Dallas. The President's address was then delivered by Dr. P. P. Starr, of Gainesville, in which he reviewed the work of the Association during the past year. The balance of the forenoon was given over to executive and business sessions.

The following officers were elected: President, Dr. A. E. Flowers, of Dallas; First Vice-President, Dr. H. L. Blackburn, of Fort Worth; Second Vice-President, Dr. W. R. Sanderson, of Brownwood; Secretary-Treasurer, Dr. J. W. Patton, of Dallas.

Fifteen graduate veterinarians were elected to membership.

The Association voted to hold a mid-winter, as well as an annual meeting, and the invitation of Brownwood was accepted for the former, while the next annual meeting will be held at San Antonio, in June.

The afternoon of Wednesday was given over to the reading and discussion of the following papers: Dr. Margaret Owen, of the Terrell Laboratories, at Fort Worth, read and discussed a very instructive paper on "Rabies." Mr. Boog-Scott, of Fort Worth, Chairman of the Live Stock Sanitary Commission, spoke at some length of the Sanitary Commission's work.

Mr. Harry Myers, of Fort Worth, Attorney for the Texas State Veterinary Medical Association, discussed the activities of the legal department. Dr. A. H. Douglass, of the Wichita Falls Board of Health, discussed in his very capable manner "The Veterinarian's Relation to Public Health." Dr. L. B. Ernest, U. S. Department of Agriculture, Bureau of Animal Industry, Washington, D. C., discussed in a masterful way the subject of "Tuberculosis Eradication."

Dr. Mark Francis, Dean of the Veterinary Department, A. & M. College of Texas, gave an illustrated lecture on "The Origin of the Domestic Animals." This lecture was open to the general public and many took advantage of the opportunity to hear Dr. Francis, who is a recognized authority on this subject. Dr. R. C. Moore, of St. Joseph, Mo., spoke of the earlier days in Texas association affairs and finished his address by some fatherly advice to the young practitioner.

Wednesday evening a banquet was given by the Association, at the Jefferson Hotel, to the veterinarians, their wives and friends. Thursday morning the Association met at a centrally

located building, in Fair Park, where an abundance of clinical material was on hand to greet the operators.

"Post-mortem Technic" was demonstrated and discussed by Dr. W. J. Crocker, of Fort Worth, formerly of the faculty of the Veterinary Department, University of Pennsylvania, and author of "Veterinary Post-Mortem Technic," in a manner that was a revelation to all present. "Sterility Work," was demonstrated and discussed by Dr. A. E. Flowers, of Dallas, who had a number of subjects available for demonstration and examination.

Dr. L. E. Warner, of Dallas, demonstrated the radical operation for fistulous withers. The ridgling operation was demonstrated by Dr. W. G. Gregory, of Fort Worth, who also performed an operation on a fistulous withers case. Gastrotomy in a dog was performed by Dr. W. G. Brock, of Dallas, who removed a rubber ball from the subject. Before the operation Dr. Brock had an X-ray examination made, which disclosed the nature of the foreign object.

Dr. R. C. Moore, of St. Joseph, Mo., operated on a fistulous tract and an open joint, in which operation he demonstrated "dulcine," a new local anesthetic. Cesarean section in a sow was demonstrated by Dr. E. F. Lanham, of Amarillo. Spaying of a bitch was performed by Dr. H. L. Blackburn, of Fort Worth. An abdominal tumor was operated on by Dr. R. H. Harrison, of Fort Worth. An abundance of other clinical material was on hand for diagnosis and treatment. It was the consensus of opinion that for the educational value, attendance and interest manifested, a very successful meeting was enjoyed.

The ladies were entertained by the wives of the Dallas and Fort Worth veterinarians, who provided shopping tours, theatre parties and a tea at the Country Club, all of which culminated in the forming of an auxiliary, with the following officers being elected. President, Mrs. L. E. Warner, of Dallas; First Vice-President, Mrs. F. E. Wellfare, of Dallas; Second Vice-President, Mrs. W. R. Sanderson, of Brownwood; Secretary-Treasurer, Mrs. L. G. Cloud, of Fort Worth.

J. W. PATTON, *Secretary-Treasurer.*

Plan To Go To Montreal, August 27-31.

MICHIGAN STATE VETERINARY MEDICAL ASSOCIATION

The forty-first annual meeting of the Michigan State Veterinary Medical Association was held at the Michigan Agricultural College, East Lansing, June 26-27-28, 1923. This was really the second annual meeting held this year, due to the fact that the constitution and by-laws was amended in February, so as to change the time of the annual meeting from February to June.

Particular attention was given to bovine infectious abortion and sterility, throughout the entire program. Dr. F. W. Chamberlain gave a demonstration on "The Anatomy of the Reproductive Organs of the Cow." Dr. E. T. Hallman covered the subject of "The Physiology of Reproduction in the Cow," as well as "The Diagnosis of Pregnancy." He also addressed the meeting on "The Care and Treatment of the Aborting Cow," "The Sequelae of Abortion Disease," and then gave a summary of "Practical Methods for Controlling Infectious Abortion and Sequelae."

Mr. I. F. Huddleson demonstrated the "Technique of Drawing Blood Samples for Serological Tests for Infectious Abortion," and later gave "An Interpretation of the Blood Tests for Infectious Abortion and Carriers." Dr. Ward Giltner spoke on general phases of the abortion problem, and called attention to the fact that the Division of Veterinary Medicine of the Michigan Agricultural College was going to devote the major portion of the time available for research work, to the study of this disease, as it was believed that abortion and its sequelae were responsible for a greater financial loss to the live stock industry of the State than any other one disease.

Dr. H. J. Stafseth demonstrated "The Technique for Drawing Blood Samples from Chickens for the Agglutination Test for Bacillary White Diarrhea," and also the technique of the test itself. Dr. Stafseth also gave a demonstration of caponizing. Dr. F. E. Stiles, of Battle Creek, Mich., gave a demonstration of the technique he uses for the administration of copper sulphate for the treatment of stomach-worm infestation in sheep. (See page 473, the JOURNAL, July, 1923.)

Dr. E. W. Porter, of Reynoldsburg, Ohio, presented a paper entitled "Some Experimental Work in Hog Cholera." (See this JOURNAL, page 580.)

Dr. H. B. Raffensperger, Bureau of Animal Industry, Chicago, Ill., gave a splendid address on "Ascarids in Swine." He ex-

plained the so-called "McLean County System of Swine Sanitation," and gave a demonstration of the gross appearance of the lungs in pigs infested with the ascarid larvae, as well as the method for demonstrating these, in fresh lung tissue, by means of the microscope.

Dr. A. E. Erickson, of Charlotte, Mich., gave "Some Observations in Cattle Practice." Dr. A. B. Curtice, of Hillsdale, Mich., spoke on "Tuberculin Testing from a Practitioner's Standpoint." Dr. W. E. Coomer, of Bay City, Mich., brought in the report of a committee that had been appointed for the purpose of establishing a standard of prices for tuberculin testing and hog cholera vaccination.

Dr. S. R. Johnson, of Lansing, Mich., presented a splendid paper entitled "Progress," in which he brought out many very good points. He spoke of the diversified nature of veterinary science at the present time, and the necessity for the practicing veterinarian being well posted on all phases of his work. He stressed the desirability of veterinarians keeping better records of their cases and called attention to the desirability of veterinarians maintaining neat and attractive offices and hospitals.

Mr. W. C. Geagley, Chief Chemist, State Department of Agriculture, Lansing, Mich., presented the subject of "Stock Tonics and Remedies." He explained the psychology of this business and reported the analysis of a considerable number of these preparations which are being advertised and sold extensively at the present time. He advocated the enactment of a law which would require the publication of the formulae of such nostrums.

Dr. Joseph Hawkins, of Detroit, addressed the meeting on his "Observations in California." Dr. Hawkins has just recently returned from a six-months sojourn in California, and he related his experiences and observations while there. Dr. Hawkins could not refrain from reminiscing on the early history of the Michigan State Veterinary Medical Association. He called attention to the fact that the Association would be forty years old on July 23, 1923. He also directed attention to the fact that he was one of the three surviving charter members, thirteen of the sixteen already having passed on to their just rewards.

Mr. H. W. Norton, Director of the Bureau of Animal Industry, reviewed the history of the various events in connection with the appropriations made by the recent legislature, in connection with

tuberculosis eradication work. He read a ruling recently made by the State Administrative Board:

"That all testing of herds be conducted by the Department of Agriculture; that in exceptional cases, if the owner of a herd wishes the same tested, he shall submit a report by a veterinarian as to the conditions and the probable number of reactors; that then, before any expenditure for indemnities is made, the veterinarian be specifically authorized by the Department; that the total amount for the year 1923-1924, for this purpose, be limited to \$25,000.00."

Dr. C. H. Clark, in the absence of Dr. B. J. Killham, State Veterinarian, assured those present that the Department of Agriculture had put forth every possible effort to secure an allotment of \$85,000, approximately one-third of the appropriation, for indemnities on tests of local practitioners. A resolution was adopted authorizing the President to appoint a committee of three, having power to act, to wait upon the Governor and endeavor to secure a reconsideration of the ruling of the Administrative Board, by which the amount of indemnities, to be paid for cattle condemned upon the tests of local practitioners, had been reduced to \$25,000.

Thirty-five veterinarians were admitted to membership, which indicated the renewed interest which is being taken in the Association. Hon. H. H. Halladay was elected to honorary membership, in recognition of his valuable services to the live stock industry of the State.

A very attractive social program had been arranged. The first evening of the meeting, Hon. and Mrs. H. H. Halladay gave a reception at their home on the Campus to the visiting veterinarians and their wives. This was followed by a motion picture entertainment, consisting of three films, "The Tale of Two Bulls," "The Horse in Motion," and "Guarding the Health of Live Stock." The pictures were followed by a dance.

Wednesday evening supper was served at the picnic grounds, following which addresses were made by Hon. H. H. Halladay, Professor Gunson of the M. A. C. Faculty, and Doctor C. G. Slemons, Health Commissioner of Grand Rapids, Mich., on the subject of "Goitre." Over 200 were present at the supper.

Dr. A. T. Cornell, of Lansing, took first prize in a judging contest held Wednesday afternoon, scoring 270 out of a possible 300 points. In a baseball game played after the judging contest,

the Non-Practicals, captained by Dr. Judson Black, defeated the Practitioners, captained by Dr. W. N. Armstrong, by a score of 9-0.

Officers for the ensuing year were elected as follows: President, B. J. Killham, of Lansing; 1st Vice-President, H. Preston Hoskins, of Detroit; 2nd Vice-President, F. E. Stiles, of Battle Creek; 3rd Vice-President, W. E. Coomer, of Bay City; Sec'y.-Treasurer, E. K. Sales, of East Lansing; Member of the Executive Board (for a term of five years) A. McKercher, of Lansing.

We Want 5000 Members This Year.

ILLINOIS STATE VETERINARY MEDICAL ASSOCIATION AND FOURTH ANNUAL UNIVERSITY VETERINARY CONFERENCE

The fortieth annual summer meeting of the Illinois State Veterinary Medical Association convened in the Auditorium of the University of Illinois, at Champaign-Urbana, Tuesday morning, July 10, 1923, with Dr. D. S. Jaffray presiding. The address of welcome was delivered by Dean Mumford, of the College of Agriculture.

The first paper on the program was by Dr. W. N. Neil, Bureau of Animal Industry, Chicago, entitled "The Organization and Work of the Federal Bureau of Animal Industry." Dr. Neil confined his paper chiefly to the activities of the Bureau in the Chicago territory. His paper will be published in the JOURNAL.

Dr. F. A. Laird, State Veterinarian of Illinois, then addressed the meeting on "The Organization and Work of the State Bureau of Animal Industry." Dr. Laird made it very plain that he intends to continue the administration of his office without fear or favor. He impressed upon the Assistant State Veterinarians that it is absolutely essential for them to do all state work, testing, etc., *personally*, and not leave such work to their assistants. He explained the *per diem* system of paying for such work, and asked the veterinarians not to expect a full day's allowance for work that required only an hour or two. He also explained why Illinois does not recognize the intradermal test for interstate shipments of cattle, stating that many men in the State were as yet unfamiliar with the proper technique of the test. Dr. Laird also explained why he would refuse to accept diagnoses made in any laboratory other than the one at the University.

Dr. W. H. Welch, President of the American Veterinary Medical Association, addressed the meeting on Association affairs, outlined the plans so far made for the meeting in Montreal, and urged a large attendance from Illinois. He was followed by Dr. H. Preston Hoskins, Secretary-Editor of the A. V. M. A., who gave additional information in connection with the program for the Montreal meeting, and gave a brief resumé of what has been accomplished during the past year under the new arrangement. He spoke of the difficulties he faced in publishing the JOURNAL, and explained why it was such a hard matter to please everybody. Dr. Hoskins stated that he had received very few complaints about the JOURNAL and had every reason to believe that his efforts to improve it were meeting with a fair measure of success.

Lt.-Col. N. S. Mayo, of the Veterinary Officers' Reserve Corps, presented the subject of "The Relation of the Civil Veterinary Profession to the Army Veterinary Service." This paper will be published in the JOURNAL.

At the afternoon session Mr. W. S. Corsa, of White Hall, Illinois, presented a paper entitled, "The Live Stock Industry of Illinois." This paper contained a vast fund of information dealing with the live stock situation in Illinois. This paper also is to be published in a future issue of the JOURNAL.

Dr. J. Howard Beard, Health Officer, University of Illinois, presented "The Relation of Animal Diseases to Public Health." This was a very comprehensive presentation of the subject, and dealt with both bacterial and parasitic diseases of animals which had been found to be communicable to man.

Professor H. P. Rusk, Head of the Department of Animal Industry, University of Illinois, read a paper entitled "The Veterinarian's Relation to Agriculture." His paper fairly bristled with observations which he had made in the course of his work, which was constantly bringing him in contact with farmers, breeders, county agents, farm advisors and veterinarians. He stated that he was of the opinion that certain indiscretions on the part of county agents and farm advisors had resulted in more harm to the veterinary profession than to any other interest in Illinois. He urged closer cooperation on the part of veterinarians and county farm bureaus, and he related the efforts which had been made by the University to bring this about.

Dr. J. J. Lintner, Bureau of Animal Industry, Chicago, was unable to be present to present a paper entitled "The Progress of

Bovine Tuberculosis Eradication in Illinois," but Dr. O. Augspurger was present to speak for him. Dr. Augspurger reported the progress being made in a number of the counties in Illinois, especially in connection with area work. He also gave an analysis of the distribution of both state and federal funds which were available for tuberculosis eradication work.

Dr. J. W. Connaway, of the University of Missouri, gave an illustrated address on "Some Pointers on Infectious Abortion in Swine." Dr. Connaway gave some first-hand information, the result of the investigational work which he has been conducting in his department. His remarks were illustrated with some very fine lantern slides.

Dr. H. H. Mitchell, Associate Professor of Animal Nutrition, University of Illinois, presented "The Mineral and Vitamin Requirements of Farm Animals and the Need for Mineral and Vitamin Supplements." Dr. Mitchell's paper indicated his close familiarity with the subject, as well as the research work which has been conducted in all parts of the world to determine the relationship between deficient diets and a number of animal diseases. He summarized the subject of vitamin requirements with a statement substantially to the effect that the fat-soluble vitamin A is of importance only to swine and poultry, under the usual farm conditions. Sheep and cattle undoubtedly get plenty of the fat-soluble vitamin in hay. He stated that calcium and phosphorus were the most important mineral elements in the diet, and that usually good roughage would supply these. Seeds and their by-products are usually deficient in calcium. He stated that farm feeds are considerably cheaper than commercial supplements, and he cautioned the veterinarians to accept with reservations the claims being made in certain current advertisements.

In the evening, following a musical entertainment at the Women's Building, Dr. David S. White, of Columbus, Ohio, delivered an address on "The Veterinary Profession." He was followed by Dr. Bohuslav Sykora, of Czecho-Slovakia, who spoke upon the veterinary situation in his country. One of the interesting remarks made by the speaker was to the effect that there was no farmer-vaccination in Czecho-Slovakia.

The morning session of the second day was opened with an address by Dr. C. P. Fitch, of the University of Minnesota, on "The Present Status of Our Knowledge of Infectious Abortion in Cattle." He was followed by Dr. W. L. Boyd, of the same

Institution, who spoke on "Sterility in Cattle." These two closely related subjects were admirably presented and thoroughly discussed by a large number of those present.

In the afternoon a wonderful clinic was held in the Live Stock Pavillion. This was divided into five sections: horses, cattle, swine, dogs and poultry. One of the demonstrations which proved most interesting was "The Technique of Passing the Stomach Tube in Swine," by Dr. E. R. Steel, of Grundy Center, Iowa. Dr. Steel also demonstrated his method of administering capsules to swine, which is done without the use of the speculum.

In the evening a banquet was served at Cooper's Cafe, the capacity of which was tested to the limit. Dr. W. J. Martin, of Kankakee, officiated as toastmaster, and called upon about a dozen of the prominent veterinarians present for after-dinner speeches.

The Friday morning session was opened by Dr. F. E. Beaudette, of the Kansas State Agricultural College, who presented a splendid paper entitled "The Field of Poultry Practice and Its relation to the Practitioner." Dr. Beaudette showed a wonderful grasp of poultry diseases and methods of diagnosis, as well as treatment. Quoting from the recent census, Dr. Beaudette stated that there were 360,000,000 chickens on the farms in this country, valued at \$1,047,000,000, which was an increase of approximately 28 per cent in ten years. Dr. Beaudette recommended against the treatment of white diarrhea, because of the danger of recovered birds becoming carriers of the infection.

Dr. E. R. Steel then presented "The Field of Swine Practice and Its Relation to the Practitioner." Dr. Steel reported that although 4,800 farmers had taken the course of instruction in hog vaccination at the schools in Iowa, only about 500 of these farmers were now doing their own vaccinating. Dr. Steel's paper was brim-full of practical suggestions, the result of his extensive observations made in Iowa and other states. He pointed out that swine practice was the mainstay of the practitioner in the Corn Belt, and he urged every practitioner to read all the veterinary literature he could and to attend as many veterinary meetings as he was able.

Prof. J. B. Rice, of the Animal Husbandry Department, addressed the meeting on the subject of "The Essentials of Swine Feeding." He gave statistics on the number of hogs marketed this year in 68 markets. He said that with the price of corn up

and the price of hogs down there was no profit in feeding corn to hogs at the present time. He thoroughly discussed the various feed stuffs, from the standpoint of their usefulness and economy as hog feeds.

Dr. J. S. Lucas, of Abingdon, Ill., gave a report on "Lead Poisoning in Cattle," illustrated with lantern slides. A large number of cattle had been poisoned through eating corn which had been mixed with lead carbonate in a freight car. The classical symptoms of lead poisoning were absent in the earlier cases, probably due to the large amount of lead which the infected cattle had digested, and, as a result, an early diagnosis as to the exact nature of the disease was impossible. A clue to the true condition was obtained through chemical analysis of the stomach contents of one of the dead animals.

Dr. V. C. Michels, Superintendent of the Division of Registration, addressed the meeting on the subject, "The License to Practice Veterinary Medicine in Illinois." He briefly described the work of his office and what the Division of Registration hoped to accomplish.

Prof. E. Roberts, of the Department of Animal Breeding, read a paper entitled "The Relation of Heredity to Certain Veterinary Problems." This was a fine paper and contained a great deal of very interesting information on the subject of heredity and so-called inherited unsoundnesses.

Dr. E. L. Quitman read a paper entitled, "The Treatment of Convulsions in Canines." Dr. Quitman divided convulsions into two classes: those which were due to removable causes and those which were incident to diseases caused by infections and dietetic deficiencies. The drugs which Dr. Quitman uses most extensively in controlling convulsions are: arecoline, apomorphine, luminal-sodium, barbital (veronal) and fluid extract of horse nettle berries, the latter a non-official remedy. Dr. Quitman's paper was full of practical suggestions for the veterinarian having much small animal practice.

Dr. John Reichel, Director of the Mulford Laboratories, Glenolden, Pa., concluded the program with an address on "Rabies." Dr. Reichel described the experiments which have been carried on in the Mulford Laboratories in the development of rabies vaccine. He called attention to the fact that apparently a very substantial immunity could be developed following the injection of rabies virus that has been killed. In one experiment it was demonstrated that a considerable number of animals

could be prevented from developing rabies, when the vaccine was administered as late as 72 hours after an infective dose of virus. Considerable discussion on the subject followed Dr. Reichel's address.

The meeting closed with the transaction of some routine business.

Plan To Go To Montreal, August 27-31.

VETERINARIANS THE MAINSTAY OF ANIMAL INDUSTRY

The man who doctors animals is a worthy coadjutor of the man who doctors men, and the Veterinary School of the University of Pennsylvania stands as high in its field as the Medical School of the same institution. The legislature has been asked to provide \$120,000, apart from the University's general appropriation, to take care of the needs of the Veterinary School for two years. The best reason for granting this money is to be found in the work of the school.

In the annual budget of waste is an item of \$5,000,000 to cover the cost of animals killed by disease. The only way to stop such waste is to enlarge the research and preventive branches of veterinary medicine, which is one of the projects embraced in the Veterinary School's program.

Animal industry in Pennsylvania is an important one. The "vet" is its mainstay. The universities of Pennsylvania and Cornell are the only colleges in the East which maintain first-class schools of veterinary medicine. The New York State Legislature thought so well of the work at Cornell last year that it appropriated \$120,000 for the veterinary school.

In the past Penn's Veterinary School has been getting sufficient money from the University's general appropriation to meet the annual deficit. This has come lately to around \$40,000. There has been nothing over for extension of the work. The \$60,000 annual grant will give a surplus for gaining some ground, by extended laboratory equipment and larger personnel, in the fight against animal diseases.

The veterinarian, it must be remembered, is the man who safeguards the public against meat and milk infections. The State cannot afford to be less generous with the Pennsylvania school which stands out at the center of veterinary science.

Philadelphia Public Ledger.

COMMUNICATIONS

VETERINARY CORRESPONDENCE COURSES

TO THE EDITOR:

My attention has been called to your editorial "How Come?" and to the action of the Philippine Veterinary Medical Association reported in the May issue of the "JOURNAL OF THE AMERICAN VETERINARY MEDICAL ASSOCIATION."

Your editorial is somewhat ambiguously worded and I am therefore not clear whether you have fallen into the same error as the Philippine Veterinary Medical Association, which has interpreted an advertisement appearing in the *Veterinary Journal* as "offering degrees," whereas it is offering tuition only.

In case you should be labouring under this misapprehension I should like to point out that veterinary degrees in this country can only be conferred by the recognized authorities and that "purchasable" degrees *never* existed.

On the other hand tuition by correspondence for almost every degree (medical, veterinary, dental, law, etc.) is undertaken by various coaching agencies. It is a legitimate business and has been the means of helping many a backward student to obtain his diploma. Moreover, these agencies are countenanced by the professional classes, who permit their advertisements to appear in their journals, *vide* the *British Medical Journal* (organ of the British Medical Association) and the *British Dental Journal* (organ of the British Dental Association), to instance only two official professional papers. No coaching agency, however, can confer or issue any degree or diploma; nor have they ever, in Great Britain, been able to do so.

We are sending a copy of this letter to the Philippine Veterinary Medical Association and are enclosing pages from the *British Medical Journal* and the *British Dental Journal* bearing advertisements of coaching agencies for your perusal.

I shall be glad if you will allow this letter to appear in the columns of your next issue.

With fraternal greetings,

Believe me,

Yours sincerely,

FREDERICK T. G. HOBDAY,

*Editor of the Veterinary Journal and Honorary Member
of the American Veterinary Medical Association.*

London, England, June 6, 1923.

A NOTE ON DR. WILLIAMS' ARTICLE ON "THE MALE AS A SPREADER OF GENITAL INFECTIONS."

TO THE EDITOR:

In an article on "The Male as a Spreader of Genital Infections," appearing in the June issue of the JOURNAL, Dr. W. L. Williams makes reference to an article on equine infectious abortion by the undersigned, placing an unintended and misleading interpretation upon the same. While we hesitate to use the columns of the JOURNAL for such discussions as this, we feel that the same should not be permitted to go unnoticed.

Apparently, the criticism is a result of our adherence to the belief that there exists a specific type of organism, capable of inducing abortion in mares. We readily agree that pre-natal death and abortion are frequently the result of conditions and infections other than specific infection. Further, we are in accord with the view that too little attention has been paid to the part the male may play in breeding problems. The fact remains, however, that aside from other factors which may produce abortion, there is an important type of bacterial life, capable of being transmitted from animal to animal, which is preeminently an abortion-producing organism.

Bacterium abortus equi gave evidence of its presence among the breeding animals of 3 of the Army Remount Depots during the fall and winter of 1919-1920. A fourth depot was subsequently involved through the shipment of animals to it from one of the infected depots early in the outbreak. At one of these depots 45 abortions occurred in a little over two months. Three of the Army laboratories, in cooperation with the veterinary personnel of the depots involved, were engaged in the investigation of the disease. A specific infection was manifesting itself in an acute manner, causing abortions among mares in various stages of gestation, on a wholesale scale. A bacterin prepared from strains of *Bact. abortus equi* isolated proved of distinct value in controlling the malady. Such was the substance of our report.

Nowhere did we indicate, as might be inferred from Williams' article, that such biological product would solve all the problems of sterility or failure to conceive, lend functional activity to atrophied testicles, clear up streptococcic and all other types of infection, etc. Our one contention—and we reiterate it here—is that such bacterin proved of distinct value in controlling an

acute outbreak of abortion which we maintain was due to *Bact. abortus equi*.

We were fully cognizant of the breeding problem which subsequently arose at one of the four depots included in our report—the one referred to by Williams. The extremely low percentage of conceptions obtained with the mares at this depot was most certainly a matter of much concern. However, without discounting in the least the seriousness of such situation, in our investigations, and from Williams' report, in his investigation, there was no evidence that such condition was a result of the continued activities of *Bact. abortus equi*. There is no reason why good results obtained in the control of one type of virulent infection among the animals at the four depots involved should be discounted because another condition, aside from the first, presented itself at one of the depots.

G. H. KOON

R. A. KELSER

Washington, D. C., July 6, 1923.

PROGRESS IN MEXICO*

TO THE EDITOR:

I am pleased to report to you that during the month of March, 1923, there was founded in this Country the General Direction of Zootechnics. This institution has filled a prominent place in our line. The Direction of Zootechnics will take care of solving all problems related to live stock, the campaign against the infectious-contagious diseases of live stock, veterinary hygiene, etc.

It has started already a completely revised edition of the laws of live stock sanitation.

Recently a convention was celebrated of all its veterinary doctors in service, distributed throughout the country, and organized a National Exposition of cattle, which has been a complete success.

The Director of Zootechnics is, at the present time, Dr. Jose Gomez Esparza, one of the most prominent Mexican veterinarians. The writer is a member of the institution, having charge of the Department of Veterinary Medicine and Live Stock Sanitation.

Under separate cover I am sending you a Bouletin printed by the Direction of Zootechnics regarding the live stock Exposition

*Translation by Dr. N. S. Mayo.

mentioned.

I would appreciate it if some of these notes should be published in the JOURNAL OF THE AMERICAN VETERINARY MEDICAL ASSOCIATION.

I am once more,

Yours very truly,

L. SANTA MARIA,

Res. Sec. (A. V. M. A.) for Mexico.

Mexico, D. F., Mexico, June 22, 1923.

Plan To Go To Montreal, August 27-31.

**PROPOSED REVISION OF CONSTITUTION AND
BY-LAWS**

TO THE EDITOR:

The comments relative to the proposed revision of the constitution that have been published have been read with interest. One or two of the critics state that the procedure has not been in accord with Article VI of our present constitution. It will be found that the report of the Special Committee on Closer Affiliation with State and Provincial Associations was adopted. One of the recommendations provided for a special committee to confer with the Executive committee to study the plans "herewith submitted." The plans were submitted as a proposed revision of the constitution. The special committee and the Executive committee held a joint session, in December, and their recommendations occur in the March issue of the JOURNAL. Wherein is there any irregularity? What portion of Article VI of the Constitution has been violated?

The proposed amendments may not meet with the approval of the association at Montreal and can be disposed of promptly. It is very evident, however, that some rather drastic changes should be made in the constitution of the A. V. M. A., so that the practitioner in rural districts and the B. A. I. veterinarian who is remote from veterinary centers shall feel that they are really a part of the veterinary profession and have something to say regarding our National Association.

Is the A. V. M. A. to continue to be the representative of the relatively few who attend the annual meetings, or is it going to become representative of the veterinary profession of America?

A. T. KINSLEY.

Kansas City, Mo., July 10, 1923.

COMMENCEMENTS

INDIANA VETERINARY COLLEGE

The annual commencement of the Indiana Veterinary College was held in the Auditorium of the College, May 18, 1923. Dr. T. A. Sigler, of Newcastle, Ind., addressed the graduates and Dr. L. E. Northrup, President, conferred the degree of Doctor of Veterinary Medicine on twenty-five candidates, as follows: Albert L. Blair, Vincent D. Bohannon, Harry W. Brown, Norval E. Christenberry, Raymond H. Dwyre, Fred Godsall, Roscoe E. Griffith, Boyd Jeffers, Fred O. Jacobson, Joseph T. Kennelly, Irvin S. Kleeman, J. Willard Larrison, J. John McClure, William M. Mohler, Glen H. Moore, John E. Murphy, Frank T. Owens, Bert S. Pierson, Marvin H. Rolighed, Arthur B. Russel, Henry R. Schrupf, Joseph S. Shirley, Amos A. Turner and Leslie E. West.

Dr. William M. Mohler of the graduating class, is a son of Dr. John R. Mohler, Chief of the Bureau of Animal Industry, Washington, D. C.

Does Your Wife Know About The Women's Auxiliary?

ONTARIO VETERINARY COLLEGE

The spring examinations of the Ontario Veterinary College, Guelph, Ontario, were completed on April 30th, and the degree of Bachelor of Veterinary Science was conferred the following day, May 1st, at a special Convocation of the University of Toronto on thirty-three graduates, as follows:

C. B. Baker, A. Bishop, E. S. Brown, E. S. Browne, A. R. Campbell, G. M. Clark, J. A. Coad, R. G. Cuthbert, F. S. Egan, S. R. Elkow, W. R. Gunn, C. S. Harris, J. L. Harvey, T. H. Heath, W. C. Hodgins, E. G. Kerslake, D. J. Lawson, H. M. LeGard, F. W. Leslie, T. B. Lindsay, R. Macdonald, A. W. McLeod, A. L. McNabb, S. E. Roe, W. A. Ross, P. L. Rouse, L. S. Side, E. V. Slack, O. C. Spencer, H. J. Tingley, L. R. Waggoner, J. W. Watt, C. Young.

Prizes and honors to the members of the graduating class were awarded as follows:

General Proficiency: First prize, H. M. LeGard, Toronto, Ont.;

Second prize, A. R. Campbell, Inverness, N. S.; Third prize, A. L. McNabb, Smith Falls, Ont.

Honourable Mention: F. S. Egan, R. Macdonald, T. H. Heath, D. J. Lawson, S. E. Roe, W. A. Ross, R. G. Cuthbert, W. R. Gunn, J. A. Coad, G. M. Clark, E. S. Brown, C. B. Baker, P. L. Rouse, O. C. Spencer, S. R. Elkow, A. Bishop, E. G. Kerslake, W. C. Hodgins, C. S. Harris, E. V. Slack.

Bacteriology: Special prize awarded by Dr. R. Gwatkin to A. L. McNabb, Smith Falls, Ont.

The Helen Duncan McGilvray Honorarium awarded to R. G. Cuthbert, Vancouver, B. C.

Plan To Go To Montreal, August 27-31.

**ALABAMA POLYTECHNIC INSTITUTE, COLLEGE OF
VETERINARY MEDICINE**

Commencement exercises were ushered in by the baccalaureate sermon, on Sunday, May 13. The following day, May 14th, was Alumni Day, devoted largely to meetings of the Alumni Association, the military exercises, and the delivery of prizes and receptions. Tuesday, May 16th, was Commencement Day proper, when about 250 graduates in all of the various courses received their diplomas. Among these were the following who received their degrees in veterinary medicine:

William W. Barlow, John William Berry, James Monroe Bryan, W. B. Castleberry, Cristobal Cuadras, Jr., James Vardaman Duckworth, C. I. Harkins, James Lee Orr, W. M. Ray, Joseph H. Ryland, W. C. Simmons, J. H. Staples, L. R. Sullivan.

Immediately after the graduation ceremonies, the Veterinary Medical Students' Association issued certificates to all of the graduates who were members of that Association. This is a custom that has long been adhered to and is always followed immediately after graduation.

A number of the graduates have gone into practice, some into meat and milk inspection, one into state work, and another will take up teaching.

Does Your Wife Know About The Women's Auxiliary?

**KANSAS STATE AGRICULTURAL COLLEGE, DIVISION
OF VETERINARY MEDICINE**

The sixteenth annual commencement exercises were held Thursday, May 31, 1923, at Manhattan, Kansas. Those who finished their course in veterinary medicine and received their degrees were:

James Frederick Adee, Russell Spencer Beaver, James Joshua Black, Carl Alfred Brandly, Frank Wright Crawford, Kent Ruggles Dudley, Frederick Earl Emery, Timothy Joseph Foley, Jr., William Darius Foss, Lloyd George Grandfield, John Albert Howarth, Glenn Benson Kirkwood, Elden Emanuel Leasure, Ching Sheng Lo, Andrew James McKee, Dorsey Addren Sanders, Rush Urban Taylor, Donald Albert Yandell.

In addition to these the following received their veterinary degrees, having completed their work with the summer session of 1922:

Aubrey McDonald Lee, James Alexander McKitterick, Jay Ralph Starkey.

Dr. Everett Alonzo Tunnicliff (K. S. A. C. '21) received the degree of Master of Science.

**AGRICULTURAL AND MECHANICAL COLLEGE OF
TEXAS, SCHOOL OF VETERINARY MEDICINE**

Commencement exercises were held Tuesday, June 5, 1923, at which two members of the graduating class were awarded the degree of Doctor of Veterinary Medicine:

Frank S. Palmer and Archie Stallings.

**COLORADO AGRICULTURAL COLLEGE, DIVISION OF
VETERINARY MEDICINE**

The annual Commencement was held in the College Auditorium Thursday, June 7th. Sixteen members of the graduating class received the degree of Doctor of Veterinary Medicine, as follows:

Van L. Bruns, William F. Fisher, Edward E. Harnden, Glen C. Harrington, Fred W. Lange, Edward G. LeDonne, Ronald A. McDonald, Jack N. Matheson, Frank P. Mathews, Luther D. Meyers, Leonard R. Pratt, Earl A. Price, George W. Rueter, Walter Schumacher, Charles R. Strange, Frank C. Wilson.

In addition to his veterinary degree, Frank P. Matthews was awarded the degree of Bachelor of Science.

We Want 5000 Members This Year.

IOWA STATE COLLEGE, DIVISION OF VETERINARY MEDICINE

Alumni Day was celebrated on Saturday, June 9th. Quite a large number of alumni were back, and a number of classes held reunions. The baccalaureate sermon was delivered to the graduating class on Sunday, June 10th, by the Rev. John Timothy Stone, of Chicago. The sermon was very forceful and to the point, and one of the keynotes was cooperation. Commencement exercises were held Monday, June 11th, and the following received the degree of Doctor of Veterinary Medicine:

Donald D. Baker, Elmer Brockmeier, William P. Brower, Lester H. Brown, Milton I. Brown, Roy F. Hess, Laurence B. Hines, Robert O. Hughes, Casper H. Larson, Charles B. McGrath, Robert W. Merriman, Fred Patterson, Roy Patterson, Johnson R. Roche, Hubert C. Smith, Duran H. Summers, Gordon Thomas, James H. Yarborough, Benjamin A. Zupp.

Mr. Casper H. Larson was honor student of his class, and Mr. James H. Yarborough received the degree of Master of Science in addition to his veterinary degree, having previously received the degree of Bachelor of Science from Clemson College, South Carolina. Messrs. Yarborough and Larson, as well as Donald D. Baker, were initiated into Phi Kappa Phi, an honorary fraternity.

Plan To Go To Montreal, August 27-31.

OHIO STATE UNIVERSITY, COLLEGE OF VETERINARY MEDICINE

The forty-sixth annual commencement was held at the Coliseum, Tuesday, June 12, 1923. Twenty-four candidates received the degree of Doctor of Veterinary Medicine, as follows:

George E. Aidman, Derwin Willoughby Ashcraft, Clinton DeLos Barrett, Leslie Herman Bennett, John Warden Burke, Fred Arthur Clarke, Gay Hartley Duke, Louis Goldberg, Stanley Palmer Graham, George Dewey Jelen, Harry Leslie Kidd, James Addison McComb, John Joseph McCrillis, Emmett Hugo Marquardt, Byron Phillips Merrick, Charles David Morrow, Edgar Michael Neiswander, Gerald Francis O'Malley, Benjamin Franklin Otto, Roger Neland Owen, Ernest Hoyt Patchen, Fred Clarence Pieper, Alphonso Smith, Carl Joseph Wallen.

Have You Secured One New Member This Year?

**STATE COLLEGE OF WASHINGTON, COLLEGE OF
VETERINARY SCIENCE**

Commencement exercises were held on Thursday, June 14, 1923. Four men were granted degrees in veterinary science, as follows:

Perry Blickenstaff, Lloyd Moss, Vernon R. Cline, John A. Ziebarth.

Mr. Perry Blickenstaff was elected to membership in Phi Kappa Phi, the honorary student fraternity, which is considered quite an honor and is evidence of exceptional scholarship. Dr. John A. Ziebarth has accepted a position in Alaska and left for that region immediately after graduation. The three other members of the graduating class went South, to take the California State Board examinations, June 20th.

Does Your Wife Know About The Women's Auxiliary?

**MICHIGAN AGRICULTURAL COLLEGE, DIVISION OF
VETERINARY MEDICINE**

The sixty-fifth annual Commencement was held in the gymnasium, at East Lansing, Monday, June 18, 1923. Seven candidates received the degree of Doctor of Veterinary Medicine, as follows:

Hazen S. Atkins, Donald Hugh Dickie, Ashton William Emery, Sherman Wesley Gingrich, William Russell Hinshaw, Louis Henry LaFond, Fred Martin Shigley.

Hon. Herman H. Halladay received the honorary degree of Doctor of Veterinary Medicine. Mr Halladay has been Secretary of the Michigan Agricultural College since January 1, 1922. Before that time he was Commissioner of Agriculture, and prior to that Director of the Bureau of Animal Industry; in all of which positions he has come in very intimate contact with the veterinarians of the State of Michigan.

Have You Secured One New Member This Year?

**CORNELL UNIVERSITY, NEW YORK STATE
VETERINARY COLLEGE**

The fifty-fifth annual Commencement was held Monday, June 18, 1923. Twenty-six members of the graduating class received the degree of Doctor of Veterinary Medicine, as follows:

James Joseph Bogan, John Lawrence Bogan, Clarence Newell

Bramer, Irvin Frederick Brenning, Ellsworth Sheffer Brown, Earl Louis Brunett, Charles Bertram Cain, Lawrence Hayes Conlon, Harold Moon DeVolt, William Herman Dohm, Walter Richard Donahoe, Charles Bessely Freer, George Hoyt Freer, Frederick Abbey Hall, James Henry Joseph Harden, Frank Charles Maus, Clifford Alexander Merritt, William John Moersfelder, William Glenn Robens, James Elias Sherwood, Lloyd Banks Sholl, Philip Rudolph Botha Smith, James Richard Tremlett, George Gustave Emil Vaselius, Earl Franklin Whipple, Aubrey Arthur Wooden.

Dr. Jacob Traum (Corn. '00) received the degree of Master of Science.

The Horace K. White prizes were awarded as follows: First Prize to Aubrey Arthur Wooden; Second Prize to Charles Bertram Cain. The Hollingworth Honorarium was awarded to James Elias Sherwood; the James Gordon Bennett Prize to Lloyd Banks Sholl; and the Jane Miller prizes were awarded as follows: First Prize to Trelford Simpson Miller; Second Prize to George Horace Ludins and Maynard Harold Mires.

Plan To Go To Montreal, August 27-31.

**GEORGIA STATE COLLEGE OF AGRICULTURE,
DIVISION OF VETERINARY MEDICINE**

The 123rd Commencement was held Wednesday, June 20, 1923, in the Chapel, where the commencement exercises of this institution have been held for the past one hundred years. This institution is the oldest state university in the country.

Three members of the graduating class received the degree of Doctor of Veterinary Medicine:

I. P. Coulter, T. Levie, C. J. Durham.

Of the twenty-five students in the Division of Veterinary Medicine, eight made distinctions of one sort or another during their college course, a percentage which will compare favorably with the students in other departments. Dr. I. P. Coulter was Business Manager of the Georgia Agriculturist, a college publication, and has been elected by the Board of Trustees as teacher in the Rehabilitation Section of the Veterinary Division. Dr. T. Levie has been elected to the position of House Surgeon in the Veterinary Division, for a period of one year. This position

each year goes to the member of the graduating class who has attained the-highest standing during the junior and senior years of the course. It carries a salary of \$1500.00 and quarters. Dr. C. H. Durham received distinction in debate.

We Want 5000 Members This Year.

**UNIVERSITY OF PENNSYLVANIA, SCHOOL OF
VETERINARY MEDICINE**

Commencement exercises were held in Weightman Hall on Wednesday, June 20, 1923. Eight members of the graduating class received the degree of Doctor of Veterinary Medicine, as follows:

Clarence John Bryer, Raymond Dawson Coneley, Robert Lynn Galt, Raymond James Lynch, John Walter McCullough, John Joseph Minnaugh, Robert Leslie Wheeler, Edward Alvan Wilson.

The J. B. Lippincott Prize of \$100, offered to the member of the senior class who, in the four years spent in the Veterinary School, attains the highest general average in examinations, was awarded to Raymond Dawson Coneley.

The Schuylkill Valley Veterinary Medical Association Prize of \$25, offered to the member of the senior class who attains the highest grade in Milk Hygiene, was awarded to Clarence John Bryer.

Have You Secured One New Member This Year?

SPOKANE HOSPITAL DISCONTINUED

The Washington State College Veterinary Hospital, which has been maintained for fourteen years, in Spokane, in conjunction with the College of Veterinary Science, at Pullman, has been discontinued. In the past the senior class has spent the fourth year of the veterinary course at the Spokane hospital branch, where better facilities were offered for clinical work than at Pullman. Henceforth all instructional work for veterinary students will be given at Pullman. According to President Holland, the move was purely one of economy. The hospital building is owned by Drs. S. B. Nelson and Otto Menig, of the Washington State College faculty. They are planning to remodel the building and convert it into an apartment house.

ARMY VETERINARY SERVICE

THE ANNUAL RESERVE OFFICERS' TRAINING CORPS CAMP OF THE MEDICAL DEPARTMENT, CARLISLE BARRACKS, PENNA.

June-July, 1923

The Reserve Officers' Training Corps camp was formally opened June 14 last, being the third camp of its kind held at Carlisle Barracks, Penna. Preliminary reports indicate an attendance of about 200 medical, 45 dental, and 11 veterinary students, a total of 256, from 17 of the larger universities situated in the East. All Reserve Officers' Training Corps units (called the R. O. T. C.) of the First, Second, Third, Fourth and Fifth Corps Areas are sending their medical, dental and veterinary students to Carlisle this year to receive summer training. Sixteen of the professors of Military Science and Tactics form the Camp Staff and serve as company commanders.

The largest representation of students is from Ohio State University; the second largest from Jefferson Medical College, and the third largest from the University of Pittsburgh, twenty-five States and the District of Columbia being represented in the student body.

Colonel P. M. Ashburn, M. C., is the R. O. T. C. Camp Commander; Major J. E. Bastion, M. C., is the Director of Training; Lieut.-Col. Wm. L. Lyster, M. C., is in command of the Provisional Battalion of students, with Major Glenn I. Jones, M. C., as Battalion Adjutant. The Company commanders and other instructors are selected from among the Professors of Military Science and Tactics (P. M. S. & T's.) and from among the commissioned personnel on duty at the Medical Field Service School at Carlisle Bks.

Upon arrival in camp the students are assigned to companies, irrespective of the school R. O. T. C. unit to which they may belong. The first few days are utilized in making physical examinations of the students, the issue of equipment, organizing units, and completing other camp arrangements, this being made instructive. The course of instruction prescribed by the War Department is entirely practical, consisting of demonstrations and problems which the students are required to work out under the supervision of instructors. Instruction begins at 7 o'clock a. m., the first two hours being devoted to calisthenics, squad

and company drills. The later periods in the day are utilized for demonstrations and short practical talks explanatory of personal hygiene, water purification, first aid, field sanitation, care of the sick and wounded on the field, handling Army equipment, and so forth.

The four student companies have been organized into the following units of a Medical Regiment: (1) Regimental Detachment; (2) a collecting Company; (3) an Ambulance Company, and (4) a Hospital Company, rotating at the end of each week, so that every student will have served in each one of these units of the Medical Regiment prior to his departure from camp. Aid stations, and Collecting stations are established, Field Hospitals are also set up and the evacuation of wounded carried out. Soldiers stationed at the post, acting as wounded, are collected, placed on litters in ambulances and brought to the Hospital station, such maneuvers covering about ten miles of territory adjacent to Carlisle Bks.

The camp is located near the historic Carlisle Athletic Field, and is similar to the usual military camp, the students in camp being quartered under canvas, utilizing field equipment and mess kits. The mess is operated by an officer who is selected from among the P. M. S. & T's. and civilian cooks are employed to do the cooking, utilizing the students in rotation as K. P's. The students have the benefit of the camp exchange, the post gymnasium, two baseball diamonds, three tennis courts, volley ball equipment, facilities for track events, and classes in equitation. Band concerts are given several times a week and the Service club is available at all times to the students. Motor truck trips to the Battlefield at Gettysburg are planned, and on July 4th a large athletic field meet was held. Reports from Carlisle indicate a ready and loyal cooperation on the part of the student body, which augurs well for this type of preparation for national defense.

Similar but smaller camps for R. O. T. C. of the Medical Department are located at Fort Snelling, Minnesota; Camp Lewis, Washington; and at Fort Sam Houston, Texas.

There are four veterinary R. O. T. C. units in the United States; at Cornell University, Ohio State University, Kansas State Agricultural College, and at the Iowa State College. The units from Cornell, Ohio State, and Iowa State are in camp at Carlisle this summer, while the unit from Kansas State is in camp at Fort Snelling.

POLO IN HAWAII

While the Hawaiian Division polo team was making a great showing on the Pacific Coast, the training of new ponies continued actively at Schofield Barracks and inter-regimental teams were developed. During the first two weeks of April the annual inter-regimental handicap tournament was held at Schofield Barracks.



THE WINNING TEAM

In the preliminaries the 11th Medical Regiment drew the bye, the Freebooters defeated the 13th Field Artillery (7-6), the 8th Field Artillery defeated the Air Service (7-5), and the 19th Infantry defeated the 11th Field Artillery. In the semi-finals the 11th Medical Regiment eliminated the Freebooters by a score of 8 goals to 4; and the 8th Field Artillery, giving the 19th Infantry 4 goals by handicap, was eliminated by the Infantry team by a score of 9 to 4.

The final game of the tournament was played Sunday morning, April 15th. The Medical Regiment gave the 19th Infantry 3 goals by handicap and won handily by a 10 to 5 score; the Infantry scoring but two points, one goal from foul and one from scrimmage.

The entry of a Medical Regiment polo team is new in Hawaii, and probably in the Army. The team was composed entirely of Veterinary Corps officers assigned to the 11th Medical Regiment and is the first successful all-Veterinary Corps team in the service. At a post smoker on April 16th, Major General C. T. Menoher, Division Commander, presented the Regiment with the O. H. Davies Trophy, a large loving cup, and the members of the winning team with individual cups, trophies presented by the Von Hamm Young Company.

The line-up and scoring of the final game was as follows:

11th Medical Regiment

	Goals
No. 1 Lieutenant Smock, V. C.....	0
No. 2 Lieutenant Caldwell, V. C.....	7 (Capt. Team)
No. 3 Lieutenant McCallam, V. C.....	1
No. 4 Lieutenant Wolfe, V. C.....	2
Total.....	10

19th Infantry

	Goals
No. 1 Captain Collins, Infantry.....	0
No. 2 Lieutenant Travis, Inf.....	0
No. 3 Lieutenant Proctor, Inf.....	1
No. 4 Captain Fenn, Inf.....	1 (Capt. Team)
By Handicap.....	3
Total.....	5

TO THE BEST BRAINS IN AMERICA

The College of Veterinary Science of the State College of Washington has published a brochure entitled "Choosing a Vocation." This is being mailed in an envelope which bears, in the upper left-hand corner, the following message:

"READ ABOUT A YOUNG PROFESSION THAT INVITES THE BEST BRAINS OF AMERICA."

Needless to say, this brochure makes a strong appeal for the right sort of young man to consider seriously the study of veterinary medicine as his life work.

NECROLOGY

OLAF SCHWARZKOPF

Major Olaf Schwarzkopf, U. S. Army, retired, died at Weisbaden, Germany, on Sunday, June 3, 1923, from pneumonia. He was buried at Capellan, near Coblenz, beside his wife, who died a little over a year ago. Major Schwarzkopf stood out as one of our most prominent figures in army veterinary affairs for many years. He was retired from active service August 19, 1919. He was born at Ostromzetzko, Germany, August 19, 1855. His early training consisted of a nine-year course at the German Gymnasiums at Bromberg and Thorn. Upon graduation from the latter he entered the Imperial Veterinary College, of Berlin, in 1875, and received his degree from this institution five years later, in 1880. From this date until 1885, he engaged in active practice in Germany.

In 1885 Dr. Schwarzkopf came to the United States to take up an assistantship to Dr. F. S. Billings, of New York City. The following year he entered the United States Army, as Veterinarian with the Eighth Cavalry, at that time stationed in Texas, serving for four months at the end of the Geronimo Campaign. In 1885 the Eighth Cavalry made the longest march on record in the United States Army, marching overland from Fort Davis, Texas, to Fort Meade, South Dakota, a distance of two thousand miles. Dr. Schwarzkopf was a member of this command.

On January 18, 1889 he resigned from the Army to accept the chair of Professor of Veterinary Medicine, in the College of Agriculture, University of Minnesota, at St. Anthony Park. He remained in this position until 1894, when he resigned to accept the deanship of the McKillip Veterinary College, of Chicago. He held this position for about two years. In 1897 he was appointed to a professorship in the American Veterinary College, New York City, in which position he remained for about three years.

In July, 1900, he was reappointed to the Army, as Veterinarian, First Class, and assigned for duty with the Third Cavalry. He served in this capacity for two years, taking part in the Philippine campaign in Northern Luzon. When the Army was reorganized, in 1901, Dr. Schwarzkopf was appointed Veterinarian of Cavalry,

and continued to serve with the Third Cavalry until 1913. During this service the Third Cavalry again saw service in the Philippines, from 1905 to 1907.

In 1913 Dr. Schwarzkopf was detailed as Veterinary Instructor, Department of Horsemanship, Mounted Service School, Fort Riley, Kansas, and when the Army Schools were discontinued, due to the Mexican Border trouble, in 1914, Dr. Schwarzkopf again returned to the Third Cavalry, for service in Texas, until 1916. From April to August, 1916, he was Recorder for the Board of Veterinary Examiners, who examined all army veterinarians for commissions in the Veterinary Corps, organized under the Act of June 3, 1916.

Dr. Schwarzkopf received a commission as Captain in the Veterinary Corps, U. S. Army, June 3, 1916, and was promoted to the rank of Major September 14, 1917. In May, 1917, Captain Schwarzkopf was ordered to the Medical Supply Depot, at St. Louis, as Officer in Charge of Veterinary Supplies. He organized the Veterinary Division of the Depot, and was stationed there until May 1918, when he was transferred to Fort Snelling, Minnesota, as Post Veterinarian. He remained at this station until September, 1918, when he was transferred to Fort D. A. Russell, Wyoming, for duty as Post Veterinarian, and was on active service there when he was retired.

Major Schwarzkopf has been a prolific writer on various subjects pertaining to veterinary medicine. He was a frequent contributor to the pages of our veterinary journals, and for many years was a collaborator on the editorial staff of the *American Veterinary Review*, up to the time when the latter became the JOURNAL OF THE A. V. M. A. He was among the pioneers who advocated proper recognition for the Army veterinarian, and as far back as 1887, while he was stationed at Fort Clark, Texas, he wrote an article entitled "The Necessity of an Organized Veterinary Corps, United States Army."

As far as available information goes, it would appear that Major Schwarzkopf was the first veterinarian in America to employ the Schmidt treatment for parturient paresis of cows. On September 15, 1898, he read a paper on this subject before the annual meeting of the New York State Veterinary Medical Society, in New York City. In this paper he gave four case reports on the new treatment, notice of which came to his attention during the previous winter when he was reading the *Berliner Tierärztliche Wochenschrift*.

He treated his first case on May 23, 1898; the second, June 2; the third, July 6; and the fourth, July 14, the same year; and it is interesting to note that even though failure resulted in the first case, he did not hesitate to give the new treatment a fair trial, with the result that recoveries followed in the second, third and fourth cases treated. This paper was published in the *Journal of Comparative Medicine and Veterinary Archives*, September, 1898, and does not appear to have been mentioned in the list of articles written by Major Schwarzkopf, as published in this JOURNAL in October, 1919.

A letter received from Major Schwarzkopf, written under date of April 18, 1923, brought the word that he was "roving around in Europe, trying to find a place of rest." Perhaps he did not realize, as he penned those lines, how short a time would elapse before he was to enter upon his final rest, one that is real and lasting, and in his case well-earned.

IN MEMORIAM

The body of Olaf Schwarzkopf is dead. His spirit has been wafted perhaps to that mysterious beyond with which there is no authentic means of communication by the inhabitants of this sphere. I knew him well. We were intimate friends. I do not know what his religious beliefs were. The religious belief of an intelligent human being is buried in the fathomless depths of his heart and is his secret only. Why should others inquire about it?

When Olaf Schwarzkopf's body died, there departed from it a noble, unselfish, honorable something which through the ages of man has remained a mystery. At his death the sympathetic heart of a gallant gentleman ceased to beat and the unwavering tenderness of a devoted husband and lover ceased to exist.

I admired and respected in him the superior spiritual qualities to which I myself aspired but never attained.

He was intensely German. Why not? Was he not a German?

Although he was transplanted too late in life to become thoroughly Americanized, I feel sure he was faithful to his adopted country and remained loyal to the flag beneath which he served so honorably.

GERALD E. GRIFFIN.

MORTON EDMUND KNOWLES

Dr. M. E. Knowles died at the U. S. veteran's hospital, at Fort William Henry Harrison, on the morning of June 16, 1923, after a protracted illness, due to myocarditis and Bright's disease.

Dr. Knowles was born at Clinton, Indiana, April 24, 1862. He graduated from De Pauw University and later attended the American Veterinary College, New York City, receiving the degree of D. V. S. in 1884. He was State Veterinarian of Indiana from 1886 to 1892, when the late Marcus Daly induced him to go to Montana, to take charge of Daly's race horses and blooded stock at his Bitter Root Stock Farm. Dr. Knowles remained in this position until 1896, when he was appointed State Veterinarian of Montana, which position he held until 1913.

When the United States entered the World War, Dr. Knowles offered his services to the government and was commissioned second lieutenant in the Veterinary Corps, in 1917. He reported at Camp Grant and was shortly afterward promoted to the rank of major, serving with the 83rd Division overseas. Shortly after his arrival in France he was selected as Chief Veterinarian on the staff of General Pershing. He served in this capacity until after hostilities ceased, having been honorably discharged July 24, 1919.

For some time Dr. Knowles was retained by the Anaconda Copper Mining Company to investigate the dangers of fumes from the copper smelters to the live stock and vegetation growing on the properties located near the Washoe smelter, at Anaconda, as well as the Great Falls smelter.

Dr. Knowles joined the American Veterinary Medical Association in 1891, and always took a deep interest in the affairs of the Association. It was said of him at the time he was elected to the presidency, at St. Louis, in 1904, that he had traveled more miles to attend A. V. M. A. conventions than any other member. Dr. Knowles was the first president to be elected from a state west of Missouri. He was a vice-president for four terms, from 1900 to 1904, when he was elected president. He presided at the meeting held in Cleveland, in 1905. He served on the Executive Committee from 1900 until 1905; as chairman of the Committee on Intelligence and Education, 1900-01; as a member of the Committee on Army Legislation, 1901-03; as chairman of the

Committee on Resolutions, 1903-04; and as Resident State Secretary of Montana, 1896-98 and 1903-04.

He was ex-President of the Montana State Veterinary Medical Association, a member of Woodmen of the World, King Solomon Lodge, A. F. and A. M., of Helena, and of Miriam chapter of the Eastern Star, and of the Acacia Brotherhood. He is survived by his widow and two sons.

Possessed of a fine intellect, a good heart and a cool head, endowed with much executive ability, eminently fair in all his dealings, frank and outspoken, he was characterized as one of nature's noblemen. As a pioneer veterinarian of the great Northwest he demonstrated his professional abilities by giving to Montana a splendid system of animal disease control, under conditions that made such work extremely difficult, and at times most discouraging. In his death our profession and his State have suffered a distinct loss.

EDWARD MERILLAT

Dr. Edw. Merillat died suddenly, at his home in Wooster, Ohio, on the morning of July 5, 1923. His death came quite unexpectedly, as he was in good health up to the time of his death, having celebrated his 62nd birthday just two weeks previously.

Dr. Merillat was born at Mt. Eaton, Ohio, June 21, 1861. He taught school in his younger days, and received the degree of Bachelor of Arts, from Columbia University, in 1888. He received his veterinary training at the McKillip Veterinary College, and was a member of the first graduating class, in 1897. In 1899 he was made Dean of his alma mater, which position he held until 1901. It is interesting to note that with the death of Dr. Merillat, on July 5th, and that of Major Schwarzkopf, on June 3rd, two former Deans of the McKillip Veterinary College have passed on within the short space of a few weeks.

In 1901 Dr. Merillat joined the faculty of the Chicago Veterinary College, as Professor of Physiology and Demonstrator of Anatomy, which positions he held until 1914, when he was compelled to give up teaching on account of a break-down in his voice. He then retired to Wooster, his former home.

Dr. Merillat joined the American Veterinary Medical Association in 1917. He was an honorary member of Gamma Chapter of Alpha Psi Fraternity, in which organization he always took a

deep interest. He was a Mason, both York and Scottish rites, as well as a Shriner. For a number of years he was an associate editor of *Veterinary Medicine*. He leaves a widow (nee Louise Smith), who is a sister of Mrs. L. A. Merillat, the Merillat brothers having married sisters. Interment was at Wooster, Ohio.

IN MEMORIAM

With the death of Dr. Edward Merillat the science of veterinary medicine lost one of its most modest, unassuming, but enthusiastic and untiring workers. Dr. Merillat was not a man who published much, he was not what would be judged by most people today a successful practitioner, but he was undoubtedly a man devoted to the science of his choice, and a student. He loved to study the cases that came to his attention, to classify the facts observed, and draw analogies from his wonderful and valuable store of acquired observations, often for the sake of the study alone.

A naturalist, besides being a veterinarian, he embodied the happy combination so seldom found in our age of specialization. He would experience as great a delight in the study of a paper on fermentations as he would in perusing a report of cesarean section.

A mind keenly alert and elastic was his, even in the last days of his life, quick to grasp the fundamental points of an investigation, to appreciate its inherent difficulties and to suggest possible lines of attack. As a result of his early training, especially interested in comparative anatomy, he took an active interest in physiology, maintaining thereby a salutary balance in his scientific attitude.

Of modest wants, a sympathizing nature and a cooperative spirit, often carried to the point of personal disadvantage, he was an inspiring co-worker, a pleasing companion, and an interesting exception in these days of struggle for financial success. A student by nature, he was a disinterested investigator. As a teacher, in his later years, during his lessons in anatomy, he would often add to the driest facts fragments from his surprisingly vast store of personal experience, which made his lectures delightfully interesting.

Dr. Merillat was a man who took the viewpoint, in the practice of his profession, that veterinary science has social links,

and a great bearing upon human welfare, nutritional as well as hygienic, and that as such it is a social science not to be exploited for personal gains, but be made to yield, directly through the actual practice of the veterinarian and the animal husbandman, and indirectly through sound hygiene and preventive medicine, values of a vast educational and physical import to the human race.

To his scientific training Dr. Merillat added a philosophical attitude which made his ideas often consonant with Metchnikoff's optimism and of a wide bearing. The loss of such a man would seem, at best, untimely, when we consider the great factor for good he really was, and would continue to be, in this world, and the greatness of the work at which he was laboring, the humanizing of veterinary science. It is to be regretted that before dying he could not leave to the world, as a legacy, in a written form, so many of his ideas which could thus yield a far greater crop in the coming generation.

However, his work in life was vast and well done, and it is our duty to pay our parting homage to the friend, the colleague and the teacher, and offer our thanks for the work he has so well and courageously done during his too short stay with us. Let us see to it, that his example of devotion to his science and his fellowmen be not forgotten in the future, and that more encouragement be given, in the training of future generations, to the development of the disinterested service which typified the life of our lost friend.

JOHN SEVENSTER

Dr. John Sevenster, of Hamburg, Iowa, is reported "deceased" by the postmaster at this place. He was a graduate of the United States College of Veterinary Surgeons, 1891, and of the McKillip Veterinary College, 1905. He was admitted to membership in the American Veterinary Medical Association in 1915.

R. LA POINTE

Dr. R. La Pointe, of St. Peter, Minn., died several months ago. He was a graduate of McGill University, in 1885. He practiced in several locations in Minnesota, and was a member of the Minnesota State Veterinary Medical Association. He joined the American Veterinary Medical Association in 1902.

HERMANN M. BIGGS

Dr. Hermann M. Biggs, Commissioner of Health of the State of New York, died on June 28, 1923, at his home on West 58th Street, New York City, from broncho-pneumonia, at the age of 64.

Dr. Biggs was elected to honorary membership in the American Veterinary Medical Association, in 1890, upon the recommendation of the late Dr. H. D. Gill. At that time Dr. Biggs was a member of the Staff of Bellevue Hospital, having gone to that institution as an interne in 1883, and continuing in many important posts up to 1914.

After graduating from Cornell University and Bellevue Hospital Medical College, he studied at the University of Berlin and the University of Greifswald, Germany. He was the first director of the Carnegie Laboratory and gave the first systematic teaching of bacteriology in this country.

From 1901 to 1914 Dr. Biggs was the general medical officer of the New York City Department of Health, during which time he also continued his work at Bellevue as Professor of Therapeutics and Clinical Medicine and, later, as Professor of Medicine. He was instrumental in establishing the first municipal bacteriological laboratory in the world, and served as its first Director. He early utilized bacteriological methods for the sanitary control of infectious diseases.

In 1895 he introduced diphtheria antitoxin into this country and directed its production by the New York City Board of Health. He inaugurated tuberculosis prevention work in New York City, and Dr. Robert Koch is reported to have said that this work was conducted in a manner superior to that of any city in the world. Dr. Biggs suggested making tuberculosis a reportable disease. In January, 1914, he was appointed by Governor Glynn, State Health Commissioner, a position he had thrice previously declined.

J. H. TENNENT

Dr. J. H. Tennent, of London, Ontario, died June 29, 1923, following a lengthy illness. Death was due to cerebral hemorrhage.

Dr. Tennent was a graduate of the Ontario Veterinary College, in 1874. He located immediately in London, and soon established

a very fine practice there, which he conducted along strictly ethical lines. His success in practice was due in no small measure to his kindly disposition. He was liked and respected by all with whom he came in contact, and a credit to his chosen profession.

In 1900 Dr. Tennent joined the Health of Animals Branch, but his headquarters remained at London. Due to his failing health, he was obliged to retire several years ago. He leaves a widow and one son, who is also a veterinarian, in the Health of Animals Branch.

Dr. Tennent was a member of the American Veterinary Medical Association since 1903, having joined when the first meeting on Canadian soil was held at Ottawa, twenty years ago.

WILLIAM JAKEMAN

Dr. William Jakeman, of North Sydney, Nova Scotia, died June 27, 1923, at the age of 79. Death was due to diabetes.

Dr. Jakeman was born in Charlottetown, Prince Edward Island, in 1844. He was a graduate of McGill University, and practiced for many years at Glace Bay, Nova Scotia. He retired from active practice several years ago and was living with his daughter, Mrs. H. W. Burchell, in North Sydney. Dr. Harry W. Jakeman, of Boston, Mass., is a son of the deceased.

Having joined the American Veterinary Medical Association in 1892, Dr. Jakeman was numbered among the older members of the Association, and probably the oldest member from Canada. He has attended quite a few meetings of the Association during his thirty years of membership. For many years he served as Resident Provincial Secretary of the A. V. M. A. for Nova Scotia.

G. M. PREDMORE

Dr. G. M. Predmore, of Avon, Ill., died May 18, 1923. He was a graduate of the Chicago Veterinary College, class of 1905. He practiced at Avon for two years and then entered the employ of the Bureau of Animal Industry, remaining in the service until about 1914, when he resigned to become the manager of the Wichita and Oklahoma Serum Company. He was in poor health for some time prior to his death. He is survived by his widow, his mother, his father and two sisters.

JONATHAN A. BRACKIN

Dr. J. A. Brackin, of Pittsfield, Massachusetts, died suddenly, Wednesday morning, March 28, 1923. Although acute heart trouble was the cause of death, he was well up until a few days before he died. He was a man of giant stature and rugged constitution, and did not use liquor or tobacco in any form.

Dr. Brackin was born in Toronto, Canada, September 3, 1852. He graduated from the Ontario Veterinary College, in 1873, at the age of 21. The year following he located in Pittsfield and built up a very fine practice in the Berkshire country, practicing throughout Western Massachusetts for almost half a century.

He was a member of the American Veterinary Medical Association from 1878 to 1883.

Dr. Brackin accumulated extensive real estate holdings in Pittsfield, at one time having owned the Kenney Hotel property and the North Union Block, on the City's main thoroughfare. He is survived by his widow, one daughter, one son, one brother and three sisters.

HENRY E. PAIGE

Dr. Henry E. Paige, of Amherst, Mass., died June 21, 1923, at his home, South Prospect Street, at the age of 70 years.

Dr. Paige was a member of the Massachusetts Legislature since 1919. From 1920 to 1921 he served on the joint standing committee of State Administration and Towns. Last year, on account of failing health, he relinquished his place on the latter. He was agent of the Massachusetts Division of Animal Industry and chairman of the local Board of Health.

Dr. Paige was born January 30, 1853, educated in Amherst schools, and received his veterinary education at the Ontario Veterinary College, graduating with the class of 1888. He was a member of Pacific Lodge F. and A. M. and the Amherst Club. He is survived by his widow, a brother and a daughter.

PAUL M. WILLIAMS

Dr. Paul Menohar Williams died May 28, 1923, at his home in Pittsburgh, Pa., after a long illness, due to chronic heart disease. Dr. Williams was a graduate of the University of Pennsylvania, class of 1922. He was member of Alpha Psi Fraternity.

WILBUR C. GOSS

Mr. Wilbur C. Goss, of Lakewood, Ohio, a brother of Dr. Leonard W. Goss, Professor of Veterinary Pathology, Ohio State University, was killed June 30, 1923, when he took hold of a guy-wire hanging down in the way of his automobile, on the road from West Hill to Akron, O. The wire carried a very heavy current and death was instantaneous.

Mr. Goss was a graduate of Western Reserve Academy, at Hudson, Ohio, and of Case School, at Cleveland. He held degrees, from the latter institution, in both mechanical and civil engineering. He was very successful in sewer construction work, having recently completed a million dollar contract for the City of Toledo, and was working on a similar contract for the City of Akron, when his untimely death occurred. He is survived by his widow, his aged mother, and Dr. Goss, his only brother.

J. H. FOWLIE

Dr. J. H. Fowlie, of Ottawa, Illinois, died suddenly, November 30, 1922, the result of an automobile accident. Dr. Fowlie was born at Odell, Ill., May 28, 1884 and graduated from the Chicago Veterinary College in 1911. He was an Assistant State Veterinarian of Illinois. He joined the American Veterinary Medical Association in 1920. Dr. Fowlie is survived by his widow, Mrs. Olga Fowlie, who is living at 905 W. Main St., Ottawa, Ill., and through whom this sad information was only recently received.

WILLIAM T. WEBB

Dr. William T. Webb, of Quarryville, Pa., died July 7, 1923. Dr. Webb was a graduate of the University of Pennsylvania, class of 1907. He had been in active practice at Quarryville ever since graduation. He joined the American Veterinary Medical Association in 1912. Death was due to an abscess, involving several ribs. He leaves a widow and three children.

JOHN MONTGOMERY

Dr. John Montgomery, of Anamosa, Iowa, a graduate of Chicago Veterinary College, class of 1912. Joined the American Veterinary Medical Association in 1918. No further particulars obtainable.

ELLWOOD P. McBANE

Dr. Ellwood P. McBane, for a short time at Frankfort, Ind., formerly at Valdosta, Ga. Born Oct. 12, 1890, at Graham, N. C. A graduate of Guilford College in 1913 and of the Indiana Veterinary College in 1916. Jointed the American Veterinary Medical Association in 1920. No further details received.

AUGUSTUS O. KOENIG

Dr. Augustus O. Koenig, of Philadelphia, Pa., died April 4, 1923. He was a graduate of the University of Pennsylvania, having received the degree of V. M. D. in 1893 and the degree of M. D. in 1894. He was engaged in the practice of human medicine.

We Want 5000 Members This Year.

BIRTHS

Dr. and Mrs. Bryce B. Binnall, of Pierson, Iowa, a son, Paul Bryce, March 5, 1923.

Dr. and Mrs. R. D. Parrish, of Montrose, Colo., a son, Rex Damron, April 5, 1923.

Dr. and Mrs. W. B. Denham, of Cumberland, Iowa, a son, James Allen, May 1, 1923.

Dr. and Mrs. Chas. Vanderschaaf, of Avon, S. D., a daughter, Margaret, June 14, 1923.

Dr. and Mrs. D. A. Illingworth, of Bennington, Vt., a daughter, Patricia, March 30, 1923.

Dr. and Mrs. William B. Hawkins, of Wayne, Nebr., a son, William B., Junior, May 26, 1923.

Plan To Go To Montreal, August 27-31.

PERSONAL

Dr. E. H. Marquardt (Ohio '23) has located at Atlanta, Ill.

Dr. H. G. Hodges (Corn. '16) is now located at Owego, N. Y.

Dr. Charles F. Wolf (Chi. '12) has returned to Eau Claire, Mich.

Dr. L. A. Dibert (Chi. '11) of Cullom, Ill., is a breeder of Pointer dogs.

Dr. A. A. Goodman (Colo. '15) has left Pueblo and located at Norwood, Colo.

Dr. C. D. Pearce (Corn. '08) has removed from Owego, N. Y. to Pawling same state.

Dr. G. Ed. Leech (Chi. '98) has been appointed City Milk Inspector of St. Paul, Minn.

Capt. T. H. Edwards (K. C. V. C. '09) is now at 655 South Catalina Avenue, Pasadena, Calif.

Dr. S. M. Friedley (Ind. '17) of Elizabeth, Ind., is a breeder of Single Comb Rhode Island Reds.

Dr. Geo. W. Todd (Iowa '22) has removed from Fort Dodge, Iowa, to Platte Center, Nebr.

Dr. D. F. Luckey has resigned as Live Stock Commissioner at the East St. Louis Stock Yards.

Dr. G. W. Ornduff (K. C. V. C. '10) has removed from Tupelo, Miss., to West Point, same state.

Dr. C. L. Phillips (Ohio '19) left Greensboro, N. C., May first, and has located at Tazewell, Va.

Dr. R. L. Goodall (Iowa '23) has selected Gilmore City, Iowa as a good place to start in practice.

Dr. Elmer W. Berg (K. C. V. C. '10) is back at the State Fair Grounds, St. Paul, Minn., for the summer.

Dr. L. R. Huffman (Ohio '93) of Paris, Ky., is engaged in the breeding of Large Type Poland China Hogs.

Lt. Ralph B. Stewart (St. Jos. '16) has been transferred to the Office of the Surgeon General, Washington, D. C.

Dr. B. J. Eno (Ohio '05) has left Vergennes, Vt., and is now located at 156 Thorndike St., East Cambridge, Mass.

Dr. Robert E. Smith (McK. '08) has left Albert Lea, Minn., and is now at Lafayette, Ind. Address, 1904 Perrine St.

Dr. F. J. Pilon (Chi.) of Champaign, Ill., has retired from active practice and will engage in farming near Champaign.

Dr. George T. Van Buskirk (U. P. '09) formerly of Willow Grove, Pa., is now with the B. A. I., stationed at Baltimore, Md.

Lt. H. K. Moore (K. C. V. C. '16) is now at the Quartermasters' Intermediate Depot, 1819 W. Pershing Road, Chicago, Ill.

Dr. Raymond S. Huff (U. P. '16), writes as follows: "The JOURNAL has shown improvement since the change. Keep it up."

Dr. B. F. Davis (K. C. V. C. '07), of Cheyenne, Wyoming, has been elected Secretary of the Wyoming Stock Growers' Association.

Dr. Perry Zenor, in the employ of the Bureau of Animal Industry, has been transferred from Helena, Montana, to Sioux City, Iowa.

Dr. S. H. Buck (McK. '14), of Marquette, Mich., has relinquished his veterinary practice and is now engaged in the dairy business.

Dr. G. A. Scott (Ont. '86) of Waterloo, Iowa, was badly hurt in an automobile accident recently, when his machine turned turtle.

Dr. D. M. Purdy (K. S. A. C. '17) has removed from Vinita, Okla., to Wichita, Kansas. He is located at 1406 South Main Street.

Dr. Ray Van Orman (Corn. '08), of Baltimore, Md., was called to Ithaca, N. Y., recently by the death of his father, Jacob Van Orman.

Dr. Archibald Freer (Corn. '13) has given up his practice at Ellensburg, N. Y., to take up work with the Dairymen's League of New York.

Dr. E. C. W. Schubel (U. S. C. V. S. '11) is now in charge of the branch office of the Missouri Valley Serum Co., at 636 E. Grand Ave., Des Moines, Iowa.

Dr. R. G. Flowers (Ont. '06), the oldest member of the A. V. M. A., in Fort Worth, Texas, writes: "I do not want to miss a copy of the JOURNAL."

Dr. C. H. Davis (Chi. '20) is with the Hereford Hampshire Home of the Crossett Lumber Company, of Crossett, Ark., with headquarters at Bastrop, La.

Dr. Jacob Kalmansohn (Cinn. '17), has been transferred from Sioux Falls, S. D., to Sioux City, Iowa. His address is 323 Exchange Bldg., Stock Yards Station.

Dr. Irwin Owens (K. C. V. C. '03) has been transferred from Fort Worth, Texas, to South St. Paul, Minn. His address is Room 633 Live Stock Exchange Building.

Dr. Russell A. Runnells (Mich. A. C. '16), of East Lansing, Mich., has resumed his post-graduate studies in the Summer School of the University of Michigan.

Dr. Raymond R. Birch (Corn. '12) and family have left Ithaca on an automobile trip that will consume most of the summer. They will go as far west as Kansas.

Dr. W. B. Cook (Ind. '10) has removed from Paterson to Perth Amboy, N. J. Although not engaged in veterinary work, he insists on getting his JOURNAL each month.

Dr. O. N. Schultz, of Latimer, Iowa, conducts a free small animal clinic every Friday morning. His swine and chicken practice has been materially augmented in this way.

Dr. M. J. Kemen, who has been assigned to hog cholera work in the Bureau of Animal Industry in Mississippi, has been transferred to the meat inspection service at Chicago, Illinois.

Dr. J. F. Bullard (Corn. '22) has relinquished his practice at Walton, N. Y., to accept a teaching position in the Division of Veterinary Medicine, Kansas State Agricultural College, at Manhattan.

Dr. W. S. Rader (K. C. V. C. '10), removed from Broken Bow, Okla., to Smackover, Ark., several months ago. He successfully passed the recent examinations of the Arkansas State Board.

Dr. H. J. Metzger (Corn. '18), Assistant Professor in the Extension Service of Cornell University, has returned to Ithaca, after a trip to Ohio, Wisconsin and Minnesota, in the interests of his extension work.

Dr. Louis A. Klein (U. P. '97), Dean of the Veterinary School, University of Pennsylvania, is a member of the Committee on Standards and Methods of the American Association of Medical Milk Commissions.

Dr. S. Brenton (Ont. '80) of Detroit, Mich., has recovered from his recent illness and is planning to attend the convention in Montreal. Dr. Brenton was recently elected an honorary member of the Persian Cat Club.

Dr. C. T. Snyder (K. C. V. C. '14) has been appointed Inspector-in-charge at Ottawa, Ill. He was formerly at National Stock Yards, Ill. Present address: c/o Chicago Butchers' and Illinois Farmers' Packing Company.

Dr. E. M. Gildow (Wash. S. C. '22) has joined the staff of the Department of Veterinary Science, University of Wisconsin, and is devoting half-time to instruction work and half-time to post-graduate work, majoring in animal chemistry.

Dr. Fay F. Russell (Ont. '13) of Concord, N. H., has been commissioned as First Lieutenant, Vet. Off. Res. Corps, and assigned to the 387th Infantry, 97th Division, U. S. A. Dr. Russell was with the A. E. F. in France during the World War.

Dr. J. F. Shigley (Corn. '15) terminated his connection with the Beebe Laboratories on July 14, 1923. He will remain in St. Paul, Minn., and engage in private practice, specializing in the diseases of breeding animals. His address is 1282 Charles St.

Dr. F. R. Beaudette (K. S. A. C. '19), who has spent the past four years specializing in poultry diseases at the Kansas State Agricultural College, has resigned his position there to accept a similar one at the New Jersey Agricultural Experiment Station, at Rutgers.

Dr. J. G. Catlett (U. S. C. V. S. '16) has resigned his position as Assistant State Veterinarian of Florida, to accept a position as Inspector-in-charge, at the Southeastern Packing Company, Fort Lauderdale, Florida, under the jurisdiction of the Board of Health of West Palm Beach.

Dr. C. M. Carpenter (Corn. '17), with his family, has returned to Ithaca, N. Y., from California, where he has spent a year engaged in research work at the University of California, on an exchange basis with Dr. Jacob Traum (Corn. '05) who has been at Cornell University for the past year.

Dr. C. L. Sanders (Cinn. '16) has associated himself in practice with Dr. R. H. Aull, of Dayton, Ohio. Dr. Sanders spent four years with the B. A. I., in meat inspection and tuberculosis eradication work; and two years as Supervising Inspector, Dairy and Food Division, Department of Health, of Akron, Ohio.

Dr. J. Payne Lowe (Amer. V. C.) of Passaic, N. J., has been reappointed, by Governor Silzer, as a member of the N. J. State Board of Veterinary Medical Examiners. Dr. Lowe has already served six years on the Board. The other appointees are: Drs. Robert Mosedale, of Bernardville; Charles E. Magill, of Haddonfield; and Ronald Butterworth, of Paterson.

Dr. J. W. Kalkus (K. C. V. C. '09), Professor of Pathology and Histology at the State College of Washington, at Pullman, left for Puyallup, July first, to take charge of the work of investigating animal diseases at the Western Washington Experiment Station. The study of infectious abortion and red-water will receive the most of Dr. Kalkus' attention. He will retain his connection with the Agricultural Experiment Station at Pullman.

Dr. B. H. Edgington (Chi. '07), formerly State Veterinarian of Ohio, has been appointed veterinary pathologist at the Ohio Agricultural Experiment Station, at Wooster. This is a new position, created at the recent session of the Legislature, in answer to the urgent demand for more research work in animal diseases, and in recognition of the necessity for a trained pathologist in connection with the extensive line of research work being conducted at the Station.

Dr. Win. Henry Kelly (N. Y. C. V. S. '89), of Albany, N. Y., accompanied by Mrs. Kelly and their daughter, Ruth, sailed for Europe on the White Star Steamer Olympic, June 30. They will visit the native home of Dr. Kelly's father, on the Isle of Man, and a number of the European veterinary colleges. Before returning they expect to see parts of England, Scotland, Wales, France, Switzerland, Italy, Belgium and Holland. They plan to return via Montreal in time for the A. V. M. A. Convention.

MISCELLANEOUS

LADDIE BOY

We've all heard and read of you, Laddie Boy,
How in glee you romp and bark,
In your rank there are but few, Laddie Boy,
In dogdom you've made your mark.
But I wonder if you think,
As the sunlight makes you blink,
That your life is rosy pink, Laddie Boy.

In that mansion grand and white, Laddie Boy,
Where you are a favored pet,
Everything must be just right, Laddie Boy,
Though I fear you sometimes fret.
Don't you care much of a rap
For a good old fashion scrap,
Just to show your pep and snap, Laddie Boy?

There's a heap of fun you miss, Laddie Boy,
And at times you must be glum,
And I know full well you wish, Laddie Boy,
That you had a boyish chum.
And you must be quite sedate
To be classed a dog of state,
But that's just your doggone fate, Laddie Boy.

There are those who envy you, Laddie Boy,
And would like to have your den,
But they're shy a ribbon blue, Laddie Boy,
And that goes for dogs and men.
Though the chance they'd gladly hail
Their wishes will not avail,
Just keep on wagging your tail, Laddie Boy.

Keep close watch on Warren G., Laddie Boy,
Get on to his point of view,
You both have high pedigree, Laddie Boy,
And he knows you're staunch and true.
May all men in this fair land
Strive to learn and understand,
And extend a helping hand, Laddie Boy.

T. P. WHITE.

IMMUNIZATION OF SWINE AGAINST CHOLERA

It is apparent from packing-house reports that some veterinary practitioners and hog owners continue to inject the serum into the hams in immunizing swine against cholera. The Bureau of Animal Industry has been advising against this practice, and several years ago instructed its field veterinarians to make their injections at some other place than the ham, preferably in the axillary space or flank. The reason for the Bureau's advice on this matter is apparent from the following letter which was written by a New York hog slaughterer to a commission firm from which it buys slaughter stock:

In a car shipped out of your yards on June 12th, containing 162 hogs (cars 2551 and 26958) we have run into a condition to which we wish to call your attention.

This load of hogs was killed on Friday (June 18) and cut up on Saturday. The car yielded 161 hogs when dressed. When cut we obtained 322 hams. Out of this lot 110 hams were immediately made into an article on which the skin and fat is removed and the bone taken out. Through this process we found 40 pieces that were bruised by inoculation and unfit for human consumption.

A loss of this kind, as you will readily understand, is not wholesome and surely cannot be endured by a packer for any length of time. Out of the balance we are certain of obtaining a certain amount of returns from the same cause.

Bruises from inoculation are never discernible from the outside of a ham and only noticeable when the bone is removed.

What we desire you to do on this shipment is to kindly trace it back from the shipping point. Advise us of the locality and, in the future when buying hogs for our account, kindly keep away from this location as much as possible. If there is a live stock association in this territory it would be wise, if the hogs are inoculated, to have the injection in a different part of the anatomy other than the ham and have it done by clean and sterilized instruments so the hogs do not become infected and are not roughly handled. This can all be done in the interests of the industry.

NEW PRESIDENT FOR PITMAN-MOORE

Announcement has been made that Mr. James E. Bartlett has acquired a controlling interest in the Pitman-Moore Company, of Indianapolis, and has assumed his duties as President and General Manager. Mr. Bartlett recently terminated a connection of over thirty years with Parke, Davis and Company, during which time he held many responsible positions, including the presidency. Mr. Bartlett's long association with the pharmaceutical and biological interests should be of enormous value to the Pitman-Moore Company in extending even further the wonderful business built up by the late Mr. Harry C. Moore. It was from the estate of Mr. Moore that Mr. Bartlett acquired his interest. There will be no change of policy under the new management.

INDIANA VETERINARY COLLEGE REORGANIZED

The reorganization of the Indiana Veterinary College has been announced. The petition for a receivership, filed on the part of some of the minority stockholders, has been withdrawn. The College is solvent and has been so at all times. The disgruntled stockholders are no longer affiliated with the College in any way whatsoever.

The 32nd session will begin September 20, 1923 and every preparation is being made to handle a good enrollment of students in the fall. The faculty has been strengthened by the addition of Dr. L. A. Merillat, of Chicago, Ill., Dr. O. L. Boor, of Muncie, Ind., Dr. J. L. Axby, of Lawrenceburg, Ind., and several other prominent veterinarians.

The annual short course will be given in January, 1924, as usual.

SOMETHING WRONG

Translated into food, at the prices the farmer gets, it takes sixty-three and one-half dozen, or 762 eggs to pay a plasterer for one day of eight hours work in New York City. It takes seventeen and one-half bushels of corn, or a year's receipts from half an acre, to pay a bricklayer one day. It takes twenty-three chickens weighing three pounds each to pay a painter for one day's work in New York. It requires forty-two pounds of butter, or the output from fourteen cows, fed and milked for twenty-four hours, to pay a plumber fourteen dollars a day. To pay a carpenter for one day's work, it takes a hog weighing 175 pounds, representing eight months' feeding and care.

—*Dearborn Independent.*

CLASSIFIED ADS

VETERINARY PRACTICE, POSITIONS, ETC., furnished and handled for sale in 48 States. Physicians, dentists and nurses furnished and located. Drug stores for sale and drug positions in all States. F. V. Kniest, Peters Trust Bldg., Omaha, Nebr.
Established 1904.

ILLINOIS PRACTICE FOR SALE. Complete hospital and veterinary equipment. Low price for quick sale. Take part cash. In corn belt. Address, 3374, c/o F. V. Kniest, Peters Trust Bldg., Omaha, Nebr.

KANSAS VETERINARY PRACTICE FOR SALE: Did \$5000 in past year. No graduate competition. Good country, stock raising. Practice will go to \$6000 year. County seat, three railroads. Address, 3375 c/o F. V. Kniest, Peters Trust Bldg., Omaha, Nebr.

GRADUATE VETERINARIAN. Seven years experience. Desires position as assistant to practitioner. Town or small city preferred. Address, Hoosier, c/o A. V. M. A., 735 Book Bldg., Detroit, Mich.

WANTED

SECRETARIES of local, county, state and provincial veterinary associations to send in the **date** and **place** of the **next meeting**, as soon as definitely fixed.

SECRETARIES of state veterinary examining boards to send in the **date** and **place** for holding the **next examination**, as soon as definitely fixed.

MEMBERS of the Association to send in the **names of Veterinarians worthy of membership in the A. V. M. A.**, so that we may get in touch with prospective members through our Resident State and Provincial Secretaries.

PRACTITIONERS to send in **case reports and short articles** on practical subjects of interest to **practitioners**.

NAMES of members who are planning to attend the **meeting in Montreal** next August, (a) by rail and (b) by auto.

American Veterinary Medical Association

H. PRESTON HOSKINS, Secretary-Editor

735 Book Building

DETROIT, - MICHIGAN

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OF THE
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W. H. WELCH, President, Lexington, Ill.

M. JACOB, Treasurer, Knoxville Tenn.

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J. A. KIERNAN

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Reprints should be ordered in advance. Prices will be sent upon application.

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COOPERATION

*Now this is the law of the Jungle—as old and as true as the sky;
And the Wolf that shall keep it may prosper, but the Wolf that shall
break it must die.
As the creeper that girdles the tree trunk, the law runneth forward
and back—
For the strength of the Pack is the Wolf, and the strength of the
Wolf is the Pack.*

—Kipling.

On more than one occasion we have heard the statement, "The only good county agent is a dead one." Having had intimate, personal contact with a number of county agents, during a five-year connection with a state agricultural college, we can readily account for the feelings of anyone who would make the above statement. But times are changing. From evidence on all sides, it would appear that an entirely different type of man is represented in some of our present-day county agents. The type to which we refer is the man who has enough balance to see the folly of posing as a veterinary encyclopedia on wheels, and sees the desirability, yes the necessity, of working with the veterinarian, and not against him or in competition with him.

There has been fault on both sides, and many veterinarians

have been guilty of antagonizing county agents, sometimes through lack of tact, sometimes through actions resulting from misguided advice, and sometimes through open warfare. As stated before, such instances are becoming less frequent, and there are many signs of both parties getting down to business, and pulling in the same direction. In fact there are evidences of increasing degrees of whole-hearted cooperation on all sides. The veterinarian can help the county agent in many ways, and the opportunities for the county agent to do the veterinarian a good turn are even more frequent.

Not so very long ago we saw county agents and veterinarians, shoulder to shoulder, fighting against what both considered undesirable legislation. This is as things should be. Our interests are often mutual. From a county farm bureau in another state, we have additional confirmation of the belief that cooperation is not only possible, but apparently desired, by all interested parties.

The present cooperation is being fostered by a farm bureau whose farm adviser is authority for the following statement: "The officers of the Farm Bureau have always been against the Farm Bureau taking up veterinarians' duties, but some of the veterinarians in the county failed to see and read conditions and a large percentage of our membership became so disgusted that they forced us to take up the serum work."

When this same farm adviser proposed to take up some cooperative work that would be of immense benefit to the veterinarians in the county, the Executive Committee hesitated. They feared the criticism of some of their members, who were of the opinion that veterinarians were non-essentials, as far as the live stock industry was concerned. The best this farm adviser could get was permission to send out a letter, calling attention to the fact that there were certain diseases which called for the services of a competent veterinarian.

Additional concrete evidence of the growth of this cooperative spirit is seen on a postal card which is being mailed by another county farm bureau to all swine breeders in the county. This card calls attention to a few facts in connection with infectious abortion of swine, and bears this caption:

"The presentation of this card to your local veterinarian entitles you to free office consultation and advice on abortion disease in swine."

This looks like business. Another county farm bureau has sent out a similar card, but bearing a slightly different message as follows:

"The local county veterinary association has agreed that any member of its association will give a free office consultation and advice on the disease referred to on the reverse side of this card."

In this case the disease referred to is bacillary white diarrhea of chickens. The card calls attention to the fact that this disease may be recognized in mature breeding stock by the "serum agglutination test," and carries the caption

CONSULT YOUR VETERINARIAN

These cards are gotten up by the Laboratory of Animal Pathology and Hygiene, of the University of Illinois, and are printed in furtherance of the Agricultural Extension Act of May 8, 1914. If you are interested in this kind of cooperation, and wish further information relative to how it is working out in Illinois, communicate with Dr. Robert Graham, University of Illinois, Urbana.

"THE PASSING OF A GREAT MAN"

To those whose horizon extends beyond national boundaries the passing of Dr. John Gunion Rutherford, C. M. G., brings more than an ordinary feeling of sorrow. In his death the veterinary profession throughout Canada and the United States sustains and feels a sense of loss such as comes only when one of its greatest and noblest members is taken. Of outstanding ability and genuine personality he was known throughout Canada as one of her foremost public men.

The final chapter in his life was completed by the tributes of respect shown by his many friends and admirers when he was laid to rest in Beechwood Cemetery, at Ottawa, on Thursday, July 26th, 1923. Rarely has such a fitting testimony of esteem been evidenced as that of the cortege which accompanied him to his last resting place. From every sphere of life men gathered to do homage to a distinguished citizen.

Dr. Rutherford was always loyal to his profession and nothing ever deterred him from attending a gathering of veterinarians, thus maintaining a close contact with the profession at all times. He was a staunch friend of the College from which he graduated and could always be relied upon to attend any function. His

addresses to the student body were always a great attraction and long remembered by those who had the privilege of hearing him. At the official opening of the new institution, at Guelph, on the 25th of November last, he delivered the leading address. He was a good public speaker and was in frequent demand at gatherings on account of the delightful manner in which he discoursed. He generally had something worth while to say and his comments on various aspects of life were always shrewd. His kindly humor and geniality were a delight, and his sturdy philosophy was a thing to be prized by those whose privilege it was to come in contact with him. After all, his greatest pleasure in life was his chosen profession and he never missed an opportunity of advancing its interest.

In the passing of John Gunion Rutherford we mourn "a really great man," a veterinarian in the highest degree and loyal to his profession throughout, the most distinguished and brilliant official that the Department of Agriculture in Canada ever had, and one of the most outstanding public men in Canada, whose name throughout the length and breadth of the land was referred to as the embodiment of a good citizen and an honorable life devoted to the best interests of his country and his fellowmen.

*"Know thou, O stranger to the fame,
Of this much lov'd, much honour'd name,
For none that knew him need be told,
A warmer heart death ne'er made cold,
The friend of man, the friend of truth,
The friend of age, and guide of youth,
Few hearts like his, with virtue warm'd,
Few heads with knowledge so informed."*

—C. D. McG.

CONVENTION REPORT NEXT MONTH

As this is being written all signs point to a splendid meeting at Montreal. The program has been completed, with only a few minor alterations as published in the August issue, assuring a well-balanced literary and scientific treat for every member, be he practitioner, sanitarian, teacher or investigator.

As we compare this program with those of former years, we are impressed anew with the changes which are taking place in veterinary science. Perhaps the change in the character of our

annual programs is even greater than the actual change in our professional activities. This is only natural, however.

The meetings of the American Veterinary Medical Association afford opportunities and occasions for the presentation and discussion of problems which are national or international in character. The time has come when strictly state and local problems can no longer take up the time of those who go hundreds, in some cases thousands, of miles to attend these annual meetings of our great Association.

This statement is not to be taken in the sense that the American Veterinary Medical Association is not interested in local problems. On the other hand the A. V. M. A. is and always has been interested in all problems confronting the profession, whether they be small or large, local or general. The officers believe that many of the smaller problems can be solved at home, however, and much more satisfactorily, with the assistance and counsel of the national association, through its officers and committees. Therefore, we believe that all veterinarians would do well to have a more nearly correct conception of what the A. V. M. A. is and what its scope and functions are.

No association can ever be any more than what its members make it. If each member would continually keep in mind the fact that he is a spoke in a big wheel, and that this wheel will turn steadily and evenly only as long as each spoke is functioning, then we will have a better and more useful organization, then we will hear less grumbling and fault-finding, and then, just as sure as night follows the day, we will all be happier, busier and more contented.

Watch for the October number. It will contain a very comprehensive report of the Montreal convention.

COMING VETERINARY MEETINGS

Massachusetts Veterinary Association. American House, Boston, Mass. Sept. 26, 1923. Dr. C. H. Playdon, Secretary, Reading, Mass.

New York City, Veterinary Medical Association of. Academy of Medicine, 17 W. 43rd St., New York, N. Y. Oct. 3, 1923. Dr. C. G. Rohrer, Secretary, 40 W. 61st St., New York, N. Y.

Dixie Veterinary Medical Association. Memphis, Tenn. Oct. 10-11, 1923. Dr. C. C. Brown, Secretary, Union Stock Yards, Memphis, Tenn.

THE FUTURE PLACE OF THE ACCREDITED VETERINARIAN IN THE ACCREDITED-HERD PLAN¹

By J. A. KIERNAN, Washington, D. C.

Chief, Tuberculosis Eradication Division, Bureau of Animal Industry, U. S. Department of Agriculture

Your worthy secretary invited me to attend and address the Missouri Valley Veterinary Association, and I assure you that I appreciate the honor.

It is needless to remind an audience like this of the importance of eradicating tuberculosis of live stock. Our cattle and swine on farms on January 1, 1923, were valued at more than three billion dollars (\$3,044,626,000.00). It is perfectly natural that the live stock owners of America should protect an interest of such magnitude. Especially is this so with respect to the ravages of tuberculosis—an eradicable disease. The reason live stock owners demand that a vigorous campaign be waged against tuberculosis is perfectly obvious. If it were a matter that made no financial difference to the producers of cattle and swine there would probably be no great demand to check the progress of the disease, but the losses sustained annually by reason of the condemnation of carcasses of cattle and swine by meat-inspection services—national, state, and municipal—have made a strong impression on the minds of those persons who raised these animals, the ones who fed them, and the purchasers of those apparently healthy animals that are condemned as unfit for food. All these interests, suffering financial losses mutually, have united in an energetic effort to check the constant and ever-increasing loss. The death of an animal on the farm occasionally is expected, but when the farmer puts an entire crop of alfalfa and corn into cattle and swine, he sustains a great shock when, after shipping them to market, he learns that a considerable percentage of them were condemned on account of tuberculosis.

During the fiscal year 1922 there were condemned for tuberculosis, under federal inspection, about thirty-two and one-half million pounds of beef and pork. Sentiment among the live stock interests became crystalized several years ago and resulted in the appearance before Congress of a committee requesting

¹Read before the thirtieth annual meeting of the Missouri Valley Veterinary Association, Omaha, Nebraska, July 23-24-25, 1923.

the appropriation of federal funds to aid state live stock sanitary officials and individuals in the suppression of tuberculosis.

I want to emphasize the feature of the genesis of cooperative, tuberculosis-eradication work in the United States. It was due to the demand by the live stock owners that the Bureau of Animal Industry was directed by Congress to take up the work. The subject of eradicating the disease had been debated at many gatherings of veterinarians in various sections of the United States for a number of years. Measures of control and suppression have been in operation in several of the states for a considerable period of time. In some states the plan of operation was confined to the physical examination of herds and the elimination of spreaders of tuberculosis when they reached the recognizable stage, which is in most instances an indication that those are not the only animals in the herd that are infected.

Many have pondered over the question of how long or how far an owner would get in control of tuberculosis by that method. It is believed that to depend upon the physical examination of cattle, as a sole means of controlling tuberculosis, leads ultimately to a herd of cattle which is 100 per cent infected. On the other hand a number of states were signally successful in keeping the disease under control by the use of tuberculin and since the campaign has developed into one that has for its object the entire elimination of the disease, such states are in a most fortunate condition.

THE BASIS OF TUBERCULOSIS ERADICATION

The controlling of the tuberculous cow is the basic foundation upon which any campaign for the eradication of tuberculosis must be built. To permit the tuberculous animal to move hither and yon is an assurance of the spread of infection, and any campaign which contemplates the eradication of the disease under such existing conditions is due, most assuredly, to fail. A study of the spread of infection within the United States is most interesting, but it differs little from the conditions brought about by the movement of tuberculous cows within the state or county, or from herd to herd. The tubercle bacillus can accommodate itself in any clime under almost any condition, if it can only find suitable media upon which to develop and the ideal condition for its propagation is in the animal body. A herd of cattle located within a county in which 50 per cent of the herds are tuberculous, may be maintained on a healthy basis, providing no animals are

introduced and the infection is not carried on to the farm in any of the ways it is possible for it to be introduced. On the other hand, a tuberculosis-free herd in the State of Utah, wherein tuberculosis of cattle is known to exist to less than one per cent at the present time, may become deeply involved with the disease, providing a tuberculous cow is introduced into that herd, and is a source of the spread of infection. Under certain circumstances favorable for the development of the disease, in that herd within a period of a year 50 per cent of the animals may be involved.

Shall I trespass upon your time to call attention to the facts that are well known to you of the danger of the tuberculous animal? There are those who believe that the disease can be controlled by allowing tuberculous animals to be associated with healthy animals, provided a regular physical inspection is made and the advanced cases removed from the herd. If I understand the sentiment of the live stock owners of the United States, they do not want to trifle with the tuberculous cow, as is indicated by the very small number of segregated tuberculous herds maintained in the country. You may call it a sacrifice, or a waste of valuable animals, or ruthless destruction, or disregard for the posterity of the respective breeds of cattle, or whatever else you may desire, but, notwithstanding the fact that many states permit the keeping of tuberculous animals under segregation on the farms, there are, comparatively speaking, but few such herds maintained in the United States. Since this campaign began approximately one-fourth of a million tuberculous cattle have been officially destroyed.

CITY PEOPLE DRINKING MORE MILK

According to a recent statement by the Department, the quantity of whole milk used in 1921 was approximately 99,000,000,000 pounds, which includes 45,000,000,000 pounds consumed as milk. Nearly 103,000,000,000 pounds of whole milk—about 4 billion pounds more—were used in 1922 in the production of butter, cheese, ice cream, milk chocolate and various other products, including 47,000,000,000 pounds consumed as milk. Notice that one-half of the 4 billion pounds increase was consumed as milk.

TUBERCULOSIS IN CALVES

There is another reason why the course that is being pursued is more desirable than the holding for indefinite periods of tuber-

culous cattle on farms where tuberculosis-free cattle are maintained. I refer to the danger of continued infection by calves from tuberculous cows held in segregation. Many of us were taught that tuberculosis of prenatal origin was unknown, but that the offspring of a tuberculous mother was predisposed to the disease. We have data which proves beyond question that in some localities, at least, calves from two days old to two weeks old are affected with generalized tuberculosis. From one small meat-inspection establishment, 23 cases of generalized tuberculosis in young calves were reported in five months. This should be an interesting point, because at several of the examinations for accredited veterinarians a question was asked about the necessity for testing calves and at least 50 per cent of the answers were that calves under six months of age need not be tested. The records show that in infected herds more than three per cent of the calves under six months of age are tuberculous. It is considered advisable to test all the cattle in the herd.

ROLE OF THE ACCREDITED VETERINARIAN

As I perceive the future place of the accredited veterinarian in the accredited-herd plan, there is no room for pessimistic thought. The part that each shall play will depend on the individual, upon his standing in the community, his skill, the confidence he can inspire in the owner of the accredited herd and his general business ability.

The accredited certificate will not change the holder of it. It will not convert the outstanding veterinary practitioner into one of mediocre ability, nor will it make a striking success of the veterinarian of small ability and restricted opportunity. As the work progresses it will mean an expanding field of activity for the accredited veterinarian. In many states, at the present time, the effect of the work has been beneficial to the local veterinarian, as set forth in the following excerpts from letters received by the U. S. Bureau of Animal Industry.

WISCONSIN

"I feel that the campaign has put the veterinary profession before the eyes of the public, such as it has never been before, and one might get about the same distance in taking away the highways in this part of the state, as one would by eliminating the tuberculin test. Just to illustrate how the people feel about the project in Holcombe Township, Chippewa County, would state that at one time Holcombe had more accredited herds than any other township in the county, and all but three have had their herds reaccredited."

"The year prior to the area test made by the combined forces of the state and government I tested about 500 cattle for tuberculosis. Last

year I tested 5,000 head. This increase was entirely due to the area test and the accredited-herd work done the two previous years."

"I can say that my tuberculosis-eradication work has increased considerably since the adoption of the cooperative work. At first I thought that the inspectors sent into my territory would take my business from me but I now see where they have made more business."

NEW HAMPSHIRE

"The accredited work has cut down my income to quite an extent. First—as the appropriation is all taken up, it leaves no money to pay for tuberculous cattle tested by the private veterinarian. Therefore, farmers are not making private tests when they can get nothing from the state, and I did a great many tests before this came into effect. Now I have answered your question fairly and squarely. Now, please do not think from this that I am one of the chronic grumblers, for I *am not*. My heart is in the work and I believe the accredited work is a great step toward cleaning up our county of a deadly menace."

"My relations with the veterinarians in this section are of the pleasantest nature and we have had no clashes whatever in the matter of charges or the encroachments on one another's territory. We have arrived at the following schedule of prices for the test on accredited herds, viz:

From one to five animals.....	\$ 5.00
From five to ten.....	7.00
From ten to fifteen.....	10.00
From fifteen to twenty.....	15.00
Above twenty, 50 cents a head up to 50.	
Over that number, a reasonable discount.	

These prices are conditional upon there being herds enough in a reasonable area having the test at the same time, thus enabling the veterinarians to inject and observe quite a number at the same time. The charge is, of course, for the intradermic test only. Where the subcutaneous is called for, the charge would have to be increased.

"To sum up, I am strongly in favor of the cooperative test and am always ready to assist you in carrying out the work in any way in my power. I have benefited in many ways from the work as carried on. The conferences held each year, and which I have attended, have been of great value to me from an educational point. My business has been increased, directly due to the work, and altogether I am strong for it. It is now thirty years since I made my first test and I have seen much change in the way it is done and have wished many times that I might never see a cow's tail or thermometer again, but the smoke went up the chimney just the same."

MASSACHUSETTS

"I am doing more tuberculin test work than at any previous period and I see some increase in the cattle practice, probably due to coming in closer touch with the owners through tuberculin testing."

NORTH DAKOTA

"The cooperative, tuberculosis-eradication work in my vicinity is an asset to me."

NEW YORK

"The N. Y. State Department of Agriculture has more accurate figures. The loss of cash work has made a difference of \$2,500 to \$3,000 in my business. Since turning over herds I formerly tested, to the Department, not a single one has been tested by me since."

"In reply to your request of May 31, 1923, I would say that the accreditation work has increased my tuberculin testing probably 4 or 5 fold in the last 2 years."

INDIANA

"I realized over \$500.00 from T. B. work so far this year, and expect it to increase each year."

TENNESSEE

"While the work was being carried on here the farmers and dairymen seemed to be more interested in building up their herds and more interested in live stock industry than ever before; of course to stimulate the live stock and dairy industry would automatically increase the veterinarian's practice. I would much rather have the practice in a section where there is eradication work being done by the Bureau and State, than the practice in a section where the work is not being done."

"In answer to your inquiry about the effect cooperative, tuberculosis-eradication work is having on private practice, will say that I do not see very much change either way. Of course there is some of this work I would get to do if it was not done through the cooperative plan, but on the other hand there is no doubt in my mind that this work has stimulated the dairy interest at this place and caused an increase in value, especially of dairy cattle, by attracting buyers from other states. Possibly this is due to the fact that all cattle in this entire county have been tuberculin tested."

OKLAHOMA

"Your force has injured my practice in dollars and cents because you have tested just the herds—dairy, etc., that were forced to test by law. These men did not care for accredited herds; all they wanted was to get the work done for nothing and they have."

NORTH CAROLINA

"As a practitioner I could not convince the farmers that their cattle should be tested for their own and their neighbors' protection, as it would appear to them that my only interest in such testing was the fee for this work. Now that the tuberculin testing of cattle is under the supervision of the state and federal governments the farmers and dairymen are being educated to the importance of the tests and the breeding of better cattle. I have occasional calls from sections of the county to which I have never been called before and I am sure that I gain these new clients through the educational work of the inspectors while testing the cattle in that section. I did more tuberculin testing last year than any previous year, although the inspectors were working in the county. I can fully realize the increase in the amount of tuberculin testing which I will be called upon to do after this county shall have become accredited."

VIRGINIA

"If it had not been for T. B. work I would have been looking for a job in some other line. I did not test a cow in the first 5 months of 1916. P. S.—On the strength of my T. B. work I have just bought a new Chevrolet."

"It has increased my practice about \$1200 per year by the inauguration of the campaign. It has increased my standing along other lines, as I find that the more a live stock owner finds you are looking after his interest the more dependence he puts in you."

SOUTH DAKOTA

"In regard to the accredited-herd work it surely has made me a wonderful success in my practice. It not only helped me in the accredited work, but it caused several individuals to be more easily influenced to do private testing. It made a great deal of difference in my financial earnings."

There are a number of sections in the U. S. in which the dairy industry is quite an important one, where, prior to the inauguration of the present campaign for the eradication of tuberculosis,

little or no tuberculin testing was done. The live stock owners did not believe in it. After cooperative work started in one locality, as above described, a private veterinarian complained to me that the salaried men were taking away his business. When questioned as to the number of herds he tested annually, he stated that there were three or four, but that the State and Bureau inspectors had taken them away from him because they did the testing free of charge. He further stated that there were around 400 herds in that locality, principally of the dairy type.

After practicing in that territory for almost 30 years he had built up a tuberculin-testing business which comprised only three or four herds and the other veterinarians in that locality did little or no testing. Since the work was inaugurated, many herds have been accredited in that section and turned back to accredited veterinarians, and one of the statements read here today was from an accredited veterinarian in that locality. Surely this campaign can not injure veterinarians in localities where previous to taking up this work they did no tuberculin testing.

I will freely concur with the statement frequently made that owners who heretofore employed veterinarians to test herds annually, willingly turned them over to State and Bureau inspectors to test because the work is done free of charge. Most of them, however, take that action because they are desirous of having their herds placed on the accredited list. It is not in the interest of the private veterinarian, of course, when owners turn herds over to official veterinarians to test, because it deprives them of the fee for the work, but under the accredited-herd plan as it operates today, the accredited veterinarian may do the initial test of accredited herds, and every other test, except the final test to accredit the herd. The final test must be a combination test, made by an official, regularly employed veterinarian.

Several months ago the Secretary of Agriculture approved the recommendation made by the Chief of the Bureau, at the instance of the U. S. Live Stock Sanitary Association, that Federal indemnity may be paid for tuberculous animals disclosed by tests made by accredited veterinarians, not to exceed 15 per cent of the allotment of the total Federal allotment for indemnity in any state. I am sure that I express the views of the Chief of the Bureau and of all the state officials in saying it would be much more desirable if the funds available for the payment of indemnity for tuberculous cattle were sufficient to pay for all cattle condemned by accredited veterinarians.

Unfortunately, such a plan can not be put into operation, due to the inadequacy of funds available. There are 450 county, state and federal veterinarians engaged in the cooperative campaign. In all probability the funds made available by the respective legislatures for indemnity will not be sufficient to keep these employes continuously engaged during the entire fiscal year. I am sure that it would not be sufficient if they were all engaged in area work. Now, let us calculate how long these funds would last, providing in addition to employes above mentioned, the 5,215 accredited were authorized to test all the herds whose owners are desirous of having the work done. The funds would be exhausted within a period of a few months.

The question may be asked why not obtain sufficient money to carry on the work in that way. I am sure that those of you who are familiar with state legislatures will appreciate the fact that every effort is being made to curtail appropriations for all activities, regardless of their value. Federal indemnity will be paid on tests made by accredited veterinarians during the current fiscal year in approximately 30 states. You know there are some states engaged in tuberculosis-eradication work in which no indemnity is paid for reacting cattle. Of course, in such states, every available veterinarian may test all the herds that come to him, but it is a fact that they do not test many herds in those states until after the official work is inaugurated. That system seems to call the attention of the live stock owners to the value of having their herds free of tuberculosis.

I could cite many instances where local veterinarians did little or no testing in states where indemnity is not paid, until after cooperative work began. It seems only reasonable to anticipate that there will be a great amount of work for accredited veterinarians to do in looking after individual accredited herds, and in keeping up the testing of herds in areas from which the disease has been eradicated.

THE ACCREDITED-HERD PLAN

This plan, as you know, was adopted by the U. S. Live Stock Sanitary Association, in December, 1917. It provides for the accrediting of individual herds which pass two successful annual tests. On June 1, 1923, there were 27,000 accredited herds; in addition there were 299,226 once-tested, free herds; and in all 425,425 herds, with an aggregate of 4,304,213 cattle under supervision for eradication for tuberculosis.

THE AREA PLAN

In outlining the plan of operation in 1917, area work was contemplated, and was described at that time as eradication of tuberculosis from circumscribed areas. No attempt was made then to launch that idea; it was held in reserve until it was believed the proper time to advocate it. In due course of time it seemed proper to start the work on that basis, and a number of state veterinarians inaugurated the work in their respective commonwealths. The area plan contemplates the eradication of tuberculosis from live stock within the geographical lines agreed upon, usually a county. That means that all the herds and all the cattle shall be tuberculin tested, that the reactors shall be branded and held in quarantine until destroyed in accordance with the regulations. This work, as well as all other phases of the regulatory work, is done under live stock sanitary regulations of the respective states. The Bureau of Animal Industry is a cooperating agency and works only on the invitation by the state to participate in the campaign.

There are two features of the area work that are deserving of attention. First: Testing of cattle in a township. This requires the services of only two or three veterinarians. The other method is to conduct a drive in a county; that is, to put in a sufficient number of veterinarians to test all the cattle within a period of two or three weeks. In counties where there is a limited amount of tuberculosis it is entirely satisfactory to conduct a drive. There are usually detailed about 30 or 40 veterinarians, including the local practitioners, if they desire to participate in the drive. However, in localities where there is a high percentage of the disease, this can not be done on account of the enormous cost of indemnities.

TWO HUNDRED COUNTIES ENGAGED

There are at the present time more than 200 counties engaged in area work in the United States. In practically all these counties 100 per cent of the cattle are tested. It has become quite a common practice in area work for the County Board of Commissioners to employ one or more veterinarians to devote their entire time to testing.

Our experience has been that it has been to the interest of the local practitioners to aid in such campaigns. A number of local men have taken part in these drives and thus became acquainted with a large number of live stock owners. The area plan is

growing in popularity and it is believed that eventually the campaign will resolve itself into that one project, because of its superiority in many ways to the accrediting of individual herds. The work can be done more satisfactorily and there is less danger of reinfection. In short, it appeals to the live stock owner as the most practical method of making progress against tuberculosis.

MODIFIED ACCREDITED AREA

In accordance with the plans of the uniform, accredited-herd work, whenever all the cattle in a county have been tuberculin tested and tuberculosis is reduced to not more than one-half of one per cent of all the cattle in the county, that county may be recommended to the U. S. Secretary of Agriculture, who has agreed to place it in what is known as the modified accredited area, and cattle from such area may be shipped interstate, at any time and for any purpose, without being tuberculin tested, providing a permit is obtained authorizing the transportation company to receive such shipments.

At the annual meeting of the American Institute of Meat Packers, in 1922, a resolution was adopted to the effect that when hogs are shipped for slaughter to market points from modified accredited areas, the packers have agreed to pay a premium of ten cents per hundred for same, providing they are found free of tuberculosis. In order to prevent reinfection among the herds in the modified accredited area, the various states have adopted regulations requiring the tuberculin testing of all cattle moved into such areas, regardless of whether they be intra- or interstate shipments. Modified areas should prove of great value to live stock owners and others connected with the industry.

A PUBLIC HEALTH QUESTION

At the outset of the cooperative campaign, the public health side of the question was not discussed because it was believed that the economic reasons for eradicating the disease were apparent to all and sufficient to carry on the work as rapidly as it should go. When it became necessary to test dairy herds furnishing milk to towns and cities, the question came to the front rapidly,—Why is it necessary to test these cattle? Is milk from tuberculous cattle a source of disseminating tuberculosis? The question could not, and should not, if it could, have been evaded in the light of what has transpired in the last five years.

I have no hesitation in saying that the veterinary profession

would be totally remiss if it did not take this great opportunity to work hand in hand with the great cooperating forces that are striving to ameliorate man's sufferings, due to tuberculosis. The veterinary profession can play and is playing a very important part in controlling tuberculosis in the human family, through its work in eradicating bovine tuberculosis. At the meeting of the National Milk Conference, held in London, England, October 16 to 18, 1922, these prophetic words were uttered by Mr. Nathan Straus, of New York, who has devoted half of his life and half of his great fortune in an effort to supply safe milk for human consumption in the city of New York. Said he:

"I crossed the Atlantic and I lost a child, and although that was over forty years ago, I have never gotten over it. If I knew what I know now I would have my daughter. Now do you realize why I take things so seriously?"

Mr Straus' great efforts have been directed to the advocacy of the pasteurization of milk, to render it safe for human consumption. It is well that a philanthropic soul should have engaged in such a humanitarian enterprise. It is well, however, that this noble worker took up this great work, for the milk that was pouring into New York City in 1912 needed pasteurization, or sterilization, or boiling, because investigations made by Hess at that time showed that sixteen per cent of the samples analyzed, contained living, bovine tubercle bacilli.

We are sometimes told that it is commonplace and ancient history to call attention to the existence of bovine tuberculosis in the human family, but as late as October, 1922, the British Government saw fit to place on the program of the National Milk Conference, Dr. A. Stanley Griffith, Research Bacteriologist, with the British Research Council of the University of Cambridge, whose subject was "Bovine Tuberculosis in Relation to Man." Dr. Griffith was on the royal commission to investigate the relationship of bovine tuberculosis to man, after pronouncements made by Professor Koch that he had come to the conclusion that human tuberculosis differed from bovine tuberculosis and could not be transmitted to cattle and that transfer from cattle to man never took place—that this transfer was so rare that he did not deem it advisable to take measures against it.

Dr. Griffith has probably typed more tubercle bacilli than any other authority. He states in his classical essay, which I hope all of you will have the privilege of reading, that "the number of English cases in which the type of tubercle bacilli has been determined now exceeds 1,200." In 116 cases of all ages 46.5

per cent of the bacilli were identified as of bovine origin; 25 per cent of the cases were in persons sixteen years and upwards.

Some of the noteworthy statements made by Dr. Griffith are as follows:

1. The bovine tubercle bacillus produces generalized tuberculosis in every way as severe as that produced by the human bacillus.

2. The proportion of cases where tuberculosis remains localized in the mesenteric glands is not greater in the bovine series than in the human.

3. Primary abdominal tuberculosis due to the human tubercle bacillus is infrequent.

We certainly must be interested in all of these investigations because they apply in our everyday life. When we appear before a local audience, or committee, or state legislature or other legislative body, and lay before them the facts regarding the transmissibility of tuberculosis to man, we do not infringe upon the rights of the medical profession, in my judgment. The veterinarian is familiar with the etiology, the pathology and mode of dissemination of tuberculosis in live stock, and knows of its relationship and its ability to affect man; therefore it is his duty to state these facts whenever the occasion requires.

At the several tuberculosis-eradication conferences held during the past five years, medical authorities have accepted invitations to address the veterinarians on the relationship between animal and human tuberculosis, and all of them have encouraged the veterinarian to lend his assistance in every way in helping to solve the human side of the question. As Col. Ousley said in his illuminating address at the St. Louis meeting of the A. V. M. A.:

"After all, a veterinarian is something of a missionary, and he is warranted in doing something more than sitting on his dignity and awaiting calls from an uninformed populace. * * * The veterinarian is the instrument of the conservation of animal values, and that makes him an economic factor of tremendous consequence. But most animals are food, and flesh is subject to subtle disease. Therefore, the veterinarian is also a conservator of human health. Thus, in a large way, the veterinarian is a vital part of the whole machinery of economic and social welfare."

These thoughts, coming from a man so closely allied with the agricultural interests of America, are well worthy of consideration.

PASTEURIZATION

The pasteurization of milk, to render it safe for human consumption, is being practiced in many states throughout the United States, and is believed by some the only thing necessary

to make milk safe. There are many other infective organisms besides the tubercle bacillus that are conveyed by milk, and there is no doubt in my mind that pasteurization is a necessary operation to destroy pathogenic organisms in milk. However, the practice of pasteurizing milk does not solve the question of bovine tuberculosis.

Wherever pasteurization is practiced to the exclusion of the tuberculin test, there you will find a high percentage of tuberculosis among cattle. I recently visited a dairy section near a metropolitan city, and was told by a number of farmers that their herds were never tuberculin tested; the milk was pasteurized and shipped to the city, and that was all that was required. Tuberculosis exists in from 25 to 35 per cent in all the cattle in that county.

A wonderful change has taken place among dairymen with respect to ordinances requiring the tuberculin testing of their herds. Heretofore, the adoption of such an ordinance almost invariably meant an application for an injunction and a long legal battle to oust the ordinance. Within the past two or three years, more ordinances of that kind have been adopted than were in existence heretofore, and with very few exceptions the requirements have met with the cooperation of the live stock owners.

The most striking order of this character was recently issued by the Louisiana State Board of Health. It requires the tuberculin testing annually of all dairy cows from which milk is sold. This applies throughout the state. It may be too broad in its scope, but it reflects the attitude of the health authorities of that state. As a resident of Washington and a patron of the dairy industry, I heartily endorse the proposed milk ordinance for the District of Columbia, which requires that all cows furnishing milk to the District shall be tuberculin tested, and all milk (except milk from certified herds) shall also be pasteurized. This principle, I think, should apply generally throughout the country; to be put in operation when it is practicable to do so.

CONCLUSION

As a profession, we see it our duty to be of service to the live stock industry of the nation. Like all other professions, ours has several branches. There is the practicing veterinarian, the laboratory worker, the investigator, the educator, the editor, and the regulatory officer. Naturally, there are different views on

many subjects but it is a matter of history that in the long run every branch of a profession has united in helping to put into execution and carry to a successful termination the problems that have confronted it.

There are many phases of the tuberculosis-eradication work that can be improved. I want you to feel that the Bureau of Animal Industry is striving in every way possible to help relieve the live stock industry of its most menacing foe. It contemplates and has always considered the rank and file of the practicing veterinarians, and the important role they are to play in the campaign to suppress that disease. It seems that as the work advances that it is shaping its course so as to utilize to a very large degree the services of the accredited veterinarian.

The manner in which the services of many are being utilized in a great many localities today is a forecast of what the future holds forth for you. When the history is written of the eradication of tuberculosis in the United States, there is no doubt that it will contain high words of praise for the valuable services rendered by the private practitioners. No man has a right today, in view of the existing conditions, to try to array the private veterinarian against cooperative tuberculosis-eradication work. In closing I want to take the time to read the two concluding paragraphs taken from the July issue of the JOURNAL OF THE AMERICAN VETERINARY MEDICAL ASSOCIATION, by Dr. H. J. Waters, Managing Editor of The Weekly Kansas City Star:

"If all the savings caused by the practicing veterinarians were added together a staggering total would be reached. Of even more importance than this saving is the service of the veterinarian in conserving the health of the human family. It is not much to expect of medical science that the insidious disease, tuberculosis, may ultimately be stamped out of our country, but it can not be accomplished without the help of the veterinarian. Be it said to the credit of the veterinarians that they have been leaders in the movement to make the United States free of tuberculosis.

"We do well, therefore, to honor the veterinary profession. We do well to support generously the colleges educating men for this important profession, that they may be more scientific and more practical in their practices and that they may be of the highest type of citizen. We are merely promoting our own welfare when we give generous encouragement and support to the patient workers in the colleges and the Department of Agriculture where the discoveries were made upon which this new science is based and where discoveries are being made that will determine the progress of this indispensable service to agriculture."

For every dollar invested in the Arizona campaign for prairie-dog eradication in 1922, there was a fifteen-dollar return in the value of farm products saved from destruction by these pests, according to reports to the United States Department of Agriculture.—*Dearborn Independent*.

THE TREATMENT OF MAL DE CADERAS WITH TRYPARSAMIDE¹

By WILSON G. SMILLIE, M. D., *Sao Paulo, Brazil*

Senior Field Director, International Health Board

Mal de caderas is the biggest economic problem of the whole vast Paraguay Valley. The disease entered the valley from the north and spread slowly down the Paraguay River. Beginning more than fifty years ago, it extended the area of its ravages down through the great state of Matto Grosso, up to and beyond the Bolivian border, and on down the river to Paraguay and the Argentine. The disease became enzootic and has caused tremendous losses every year. In Matto Grosso alone, thousands of horses die annually from the disease, the animals being lost just at the season when they have become well trained and are most urgently needed in the catching of the wild cattle. Some of the larger ranches lose almost all their horses each year, sometimes 200 or more, and the smaller ranches, though sometimes escaping the plague for a year or two, eventually have their entire herds wiped out by the disease.

The disease is caused by a trypanosome, discovered and described by Elmassian¹ and named *Trypanosoma equinum*. Horses are especially susceptible to this parasite. In all my travels, I found no authentic case in which a horse that had once developed characteristic symptoms of paresis, subsequently recovered. Mules are less susceptible; the disease is more prolonged and cases of recovery are not uncommon. The common laboratory animals are easily infected with *Trypanosoma equinum* and usually the infection terminates fatally. Brazilian scientists believe that the disease is transmitted by one of the biting flies, *Lepidoselaga lepidota*, a tabanid, commonly called "matuca" by the natives. Migone², of Paraguay, noted extensive epizootics among a type of large rodent called the "capivara" along the water courses. He observed that the animals showed a very curious type of paresis and readily demonstrated *Tr. equinum* in the blood of the infected animal.

Many different drugs have been used in the treatment of the disease without marked beneficial results. Migone³ has recently reported encouraging results with Bayer "205," the formula for

¹From the Studies of the Instituto de Hygiene, Sao Paulo, Brazil.

which has not been given. Ranchmen on the Upper Paraguay, however, have used this drug to some extent but find it quite toxic in effective doses (3 grams intravenously).*

The Rockefeller Institute for Medical Research has been engaged upon a chemotherapeutic investigation of the treatment of trypanosome and spirochete infections for several years, and among the drugs made and studied was one which possessed a marked therapeutic action in experimental trypanosomiasis. This drug, the sodium salt of N-phenylglycineamide-p-arsonic acid, was first made in 1916 by Jacobs and Heidelberger¹ and has since been named tryparsamide. The toxicologic and therapeutic studies were carried out by Brown and Pearce⁵. They treated various species of laboratory animals infected with a number of trypanosomes, as for example, the causal agent of sleeping sickness in human beings, of dourine, of nagana, of surra, and also of *mal de caderas*. The therapeutic effects obtained with tryparsamide in these experimental infections and the results of the toxicologic investigations were such that a trial of the drug in human trypanosomiasis (African sleeping sickness) was desirable. The first employment of the drug was made in 1920 by Pearce⁶ of the Rockefeller Institute, in patients suffering from this disease in the western part of the Belgian Congo. The preliminary results obtained were encouraging and at the present time the drug is being used by a number of physicians in Africa. In addition, it has been sent to government officials in South Africa and India for therapeutic trials in nagana and surra of domestic animals.

In the course of the investigations of Brown and Pearce, it was noted that tryparsamide was an efficient therapeutic agent in the infections produced by the trypanosome of *mal de caderas*. In view of these results, the Instituto de Hygiene of Sao Paulo, Brazil, became interested in the subject and procured some tryparsamide from the Rockefeller Institute. Dr. Nova Gomez*, one of the volunteer staff members of the Instituto, repeated the therapeutic experiments of Brown and Pearce, inoculating rabbits with an Argentine strain of *Tr. equinum*, and after the animals were markedly affected, treating them with tryparsamide. The results obtained were wholly satisfactory in those instances in which the treatment was instituted before the animals became extremely ill and prostrated.

The Brazilian Land and Cattle Company, hearing of tryparsa-

*Personal communications.

mide, kindly invited me to use the drug at their vast cattle ranch at Descalvados, Matto Grosso, on the upper reaches of the Paraguay River, where *mal de caderas* is endemic in its severest form. Facilities for travel across western Brazil are meager and the voyage up the Paraguay River to the Descalvados Ranch is a slow and haphazard process. Thus it was possible to study the effect of single doses of tryparsamide administered to a few cases of the disease at widely different enforced stopping places in the course of the voyage. One of these was at the Miranda Estancia and another at the Port of Corumba.

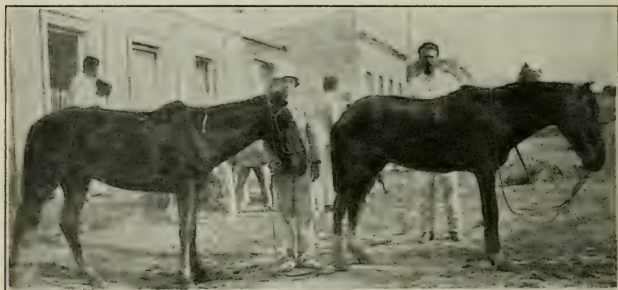


Fig. 1. These horses show the advanced stages of *mal de caderas*, with drooping head, sleepy expression, swaying gait, marked anaemia and marked loss of weight. Trypanosomes are very scanty in the blood.

The diagnostic procedure employed to determine the presence of *Tr. equinum* was as follows: 5 cc of blood were withdrawn from the jugular vein into a centrifuge tube containing a small amount of 2% sodium citrate solution. The blood was centrifuged in a hand centrifuge at high speed for three minutes, when the blood serum became clear and the layer of white corpuscles was clearly defined. Three or four drops of serum were withdrawn with a capillary pipette from the level of the layer of white blood corpuscles, transferred to a slide, covered with a cover-glass and examined immediately for parasites. Two preparations were made from each tube of blood and each specimen was searched for one-half hour before it was discarded as negative. The temperature of the air during the day varied from 90° to 100° F. so that we were working with almost a "warm stage" preparation. The trypanosomes, when present, were easily seen because of their active motility and high refrac-

tility and they remained actively motile in the citrated blood for many hours.

Single doses only of 5.0 grams of tryparsamide were administered at the Miranda Estancia and at Corumba. The drug was dissolved in 20.0 cc of normal saline and administered intravenously.

STUDIES AT MIRANDA ESTANCIA

Miranda Estancia is at the junction of the Miranda and Paraguay Rivers, in Brazil. This ranch has long been invaded by *mal de caderas*, losing practically all its horses each year, and usually necessitating the annual purchase of 150 new horses. The disease had not commenced at the time of our visit—March, 1922. Eighteen of the horses of the home ranch were examined, as our time was limited. All seemed healthy and were actively at work. Thirteen of the eighteen horses examined were considered as negative. Their temperatures (taken per rectum) were normal, ranging from 99.5° to 101° F. and no parasites were found in the circulating blood. Horses Nos. 15 and 17 had temperatures of 102.4° and 102.1° respectively, but blood examination yielded negative results. 10 cc of citrated blood were withdrawn from the vein of each horse and injected intraperitoneally into two young dogs. Six weeks later these dogs were found to be negative.

Horse No. 1 seemed in good condition, but had a temperature of 103° F. and the blood was swarming with trypanosomes, there being ten or fifteen in every microscopic field. This horse was treated at 4 p. m. with 5.0 grams of tryparsamide, given intravenously in 20.0 cc normal salt solution. At 9 a. m. the following morning, 17 hours after treatment, the blood showed a very few trypanosomes. They were very much less active than those seen the previous day. Many masses of trypanosomes were agglomerated and moving feebly. Phagocytic cells were seen which contained considerable numbers of trypanosomes in all stages of disintegration.

Horse No. 9 had a temperature of 103.9° F. and showed a blood picture similar to that of Horse No. 1, except that fewer parasites were present. The horse was thin but active and at work. He was given 5.0 grams of tryparsamide intravenously at 4 p. m. The following morning at 9 a. m. only one active living trypanosome was found in the blood preparation.

Horse No. 13 was one of eleven survivors that had come through the epizootics of the previous year, in which over 100 horses had

been lost. The animal had never been sick and had a normal temperature—100.1° F. Nevertheless, on careful search, a few trypanosomes were found in its blood. This case led us to suspect that the horse itself may be the most important carrier of the disease; the surviving horses which do not develop symptoms and are consequently not shot, carry the parasite in their blood from season to season or from year to year. This horse was treated with 5.0 grams of tryparsamide administered intravenously at 4 p. m. The following morning no parasites were found in the blood.

A subsequent report from this ranch, four months later, stated the *mal de caderas* struck the ranch about two months after my visit, destroying a large number of horses. Horse No. 1 died of the disease, but horses Nos. 9 and 13 did not develop symptoms.

EXPERIMENTS AT CORUMBA

While waiting for the up-river launch at Corumba, a port on the Paraguay River, a considerable number of horses and mules were brought to us for examination. A certain proportion of those examined were found to be infected with *Tr. equinum* and may be divided into two groups—early and advanced cases.



Fig. 2. By routine blood examination, three of these horses were found infected with *mal de caderas*. The horses were actively at work and the only symptom was an intermittent fever. These cases respond well to tryparsamide.

Group A. Early Cases. Eight horses and two mules were in the early stages of the disease. They were active and working daily, and the only symptomatic evidence of *mal de caderas* in six was a gradual loss of weight, despite a good appetite. All had an intermittent or continuous fever of one to three degrees F. but only two were beginning to show the characteristic symp-

toms of the disease, namely, weakness and a peculiar swaying of the hind quarters. All eight animals were treated with 5-gram doses of tryparsamide, given intravenously.

A report one month later showed that the two mules and four of the horses were active and well; one horse had developed marked symptoms and had been shot, and three horses which had shown some improvement were again on the decline.

Group B. Late Cases. Nineteen horses showed marked symptoms of the disease. They were very thin and weak; some were almost unable to stand, and others were unable to rise after they had fallen. Most of them had a high fever. We noted that the horses with high fever usually had the largest numbers of parasites in their blood. In the last stages of the disease the temperature falls to normal or subnormal and only a rare parasite is found in the circulating blood. These cases show marked paresis and at times almost complete paralysis of the hind quarters.

All nineteen horses were given 5.0 grams of tryparsamide dissolved in 20 cc of normal salt solution and injected into the jugular vein. Eighteen hours later those horses that had had the largest number of parasites were re-examined. In some instances not a single living parasite was found, though enormous numbers had been seen on the previous day. In three of the cases, living parasites were still found but in greatly diminished numbers. In some instances the blood picture was striking, in that the parasites were agglomerated in great masses of fifteen to thirty organisms forming a slowly revolving, wriggling mass. The phagocytic cells contained masses of parasites in various stages of disintegration.

One month later we received a report of these horses. Eight of the nineteen had died, some of the most advanced cases dying only a day or two after treatment. Eight horses had improved greatly, seemed well and were working hard under trying conditions. Three horses were in about the same condition as before.

These preliminary experiments at Miranda Estancia and at Corumba showed that the administration of a single dose of 5.0 grams of tryparsamide rapidly reduced the number of parasites in the circulating blood and in certain instances appeared to sterilize the blood, as far as could be determined by microscopic examination of centrifuged specimens. In addition there was marked clinical improvement in some animals especially in the early stages of the disease. However, it was clear that a single dose of 5.0 grams was not a sufficient treatment to destroy all

the trypanosomes in an infected animal and thus bring about a permanent arrest or a cure of the disease.

EXPERIMENTS AT DESCALVADOS RANCH, PARAGUAY RIVER, BOLIVIAN BORDER

Conditions at the Descalvados Ranch were most favorable for our field studies. The disease had swept the ranch every year, usually beginning about the end of February. In March, 1922, when we arrived, it had not yet begun to destroy the horses though it was expected daily.

One hundred and thirty-five horses were examined; 18 at the home ranch, 100 at Boa Vista Camp, and 17 at José Alexandrino. None of the horses showed clear-cut symptoms of paresis by means of which the ranchmen could diagnose the disease. It was suspected in some, for they were getting thin despite good care, but none had yet shown the characteristic swaying of the hind quarters. Nevertheless microscopic examination proved that 47 of these horses were infected. Twenty-eight of the group had increased temperatures and a considerable number of parasites in the blood. These we believe were early and active cases of the disease. Some few had no fever, were in good condition and had only a very rare parasite in the blood. These I suspect were latent cases of the disease, for some of them had been through two or three outbreaks without developing symptoms.

Administration of Single Doses: Two horses that had fever and were becoming thin, and in whose blood trypanosomes were found, were first given 6.0 grams of tryparsamide intravenously in 20.0 cc normal saline. After 24 hours no parasites were found in the blood. The temperatures of the horses promptly dropped to normal and remained there. Both horses improved rapidly. Seven days later one parasite was found in the blood of Horse D1. It was clear, therefore, that a single dose of 6.0 grams had not sterilized the blood of this infected horse.

One group of 10 horses were given a single dose of 8.0 grams of tryparsamide intravenously. None showed the characteristic last-stage symptom of paresis, though almost all were becoming thin. Six horses had definite fever and showed considerable numbers of parasites in the circulating blood, while four had no fever and only a rare parasite could be found in the blood. All these horses began to improve at once. Their temperatures dropped abruptly to normal, and for 30 days they gained in weight and strength and seemed almost normal, with the excep-

tion of horse A3, which was found dead in the pasture. The owner believed that death was probably caused from snake-bite.

We received a report, about three months later, stating that horses A6 and A9 had relapsed and were beginning to stagger. A second treatment of 8.0 grams of tryparsamide was then administered to all the horses in this group, nine in number. An immediate improvement followed this treatment and at the last report, four months later, all the horses were well.

These first experiments with tryparsamide showed that single doses of 6.0 to 8.0 grams given intravenously to a 300-kilo horse did not permanently sterilize the blood of the infected animal. On the other hand, the administration of single doses of the drug produced prompt and beneficial effects, such as the cessation of fever and a well marked physical improvement which lasted for several weeks or months. Moreover, the re-treatment with a single dose of 8.0 grams was followed by a normal clinical condition for at least four months. The next step, therefore, in these preliminary therapeutic trials was the administration of repeated doses.

Administration of Repeated Doses: In order to determine the possible toxic effects of repeated large doses of tryparsamide, a small horse (250 kilos), infected with *mal de caaderas*, was given 8.0 grams of tryparsamide intravenously (0.032 grams per kilo). No parasites could be found in the blood 24 hours later. Three days after the first treatment 12.0 grams (0.048 grams per kilo) were given intravenously. The animal showed no toxic or other symptoms whatever, either immediately or later. In this connection mention should be made of the toxicologic experiments of Brown and Pearce⁵. They considered a single dose of 0.75 grams per kilo given intravenously as a lethal dose for the rabbit, since an occasional animal succumbs to this amount. Large, sublethal doses, however, may be repeated at frequent intervals. The approximate lethal dose for the monkey is placed at not less than 1.0-1.25 grams per kilo, administered intravenously, and they cite one instance in which four doses were given in three weeks (0.75, 1.0, 1.25, 1.5). The monkey showed slight signs of intoxication, lasting for a few days, with subsequent recovery. Pearce⁶ reports the intravenous administration, with no untoward effects, of three weekly doses of 7.0 grams to a man weighing 62.5 kilos (0.336 grams per kilo). A comparison of these doses indicates that larger doses than 12.0 grams could probably be administered to 300-kilo horses without toxic manifestations.

When the results of this experiment were obtained, 29 infected horses were treated with repeated doses according to the following plan. Twelve horses were given two doses of 8.0 grams of trypanamide intravenously with an interval of 20 days. Twelve other horses were given two doses of 8.0 grams with an interval of 20 days; the first given intramuscularly and the second intravenously. Five infected horses were held as controls, separated from the treated horses and kept in a distant pasture.

All the horses were about the same weight, approximately 250 to 300 kilos. All were in the early stages of the disease or were latent cases, and showed trypanosomes in the circulating blood in greater or lesser number. Some had considerable fever but the majority had none or a fever of an intermittent type. A few were thin, but none showed the characteristic paresis, and the ranch owner was astonished as one after another of the apparently normal horses was found to be infected.

Thirty-six hours following treatment, all horses were re-examined, and although in every case a careful microscopic search of centrifuged blood was made, no parasites were found. Those horses which had been treated intramuscularly all had marked swelling and tenderness about the area of injection. This edema increased and at the end of 3 days the horses seemed quite ill with considerable fever— 103° to 104° F. and would not eat. The condition entirely disappeared by the end of a week and there was no abscess formation or sloughing. Pearce recommends intramuscular injection with trypanamide in the treatment of sleeping sickness in human beings, but our experience showed that the intravenous method is preferable in the treatment of horses.

The treated horses were placed in an isolated pasture and left to the care of the ranch manager. Twenty days following the first treatment, the second treatment of 8.0 grams of trypanamide was administered. None of the horses had developed symptoms, but the controls had all declined perceptibly.

A report received at the end of 3 months stated that *mal de caderas* had broken out in the portion of the ranch herd that had not been examined or treated and some of the horses had died. The five controls had all died. The 24 horses that had received two treatments of 8.0 grams of trypanamide were working actively and had shown no symptoms of disease.

A second report, 6 months later, and 9 months after treatment, stated that *mal de caderas* had swept the surrounding ranches but that the 24 treated horses had remained well.

DISCUSSION

In addition to our observations upon the value of tryparsamide in the treatment of *mal de caderas*, certain facts were noted which we believe may have an important bearing upon the epizootology and prophylaxis of the disease.

In the first place, the "matuca" which transmits the disease is prevalent during only a short period—November to February—at Descalvados. At the time of our voyage in March and April there were very few to be found along the Paraguay River. It is probable that the fly is not an important factor as a carrier of the parasite, from season to season, but rather acts as a transmitter of the disease during the hot season.



Fig. 3. Note the position of the legs of Horse No. 2. His forelegs are wide apart, acting as props; there is a partial paralysis of both hind legs. These cases are too far advanced to be cured by treatment with tryparsamide.

Migone² suggests that the "capivara," a large rodent which is highly susceptible to the parasite, may be an important reservoir of infection. But the "capivara" inhabits the margins of the large rivers, whereas the horses are usually placed several miles from the rivers in upland pastures.

Our observations suggest that the horse itself, and also the mule, which is less susceptible to the parasite, may be the chief latent sources of infection for the herd.

To the ranchman, a horse has not been considered as infected with *mal de caderas* until definite and characteristic symptoms of paresis develop; then the animal is shot at once, as it is recognized that a fatal termination is inevitable. Our experiments emphasize the fact that there are two phases of the disease. First, there is the phase of blood invasion. In this stage the horse appears normal and works actively. He may have fever and be

losing weight, but the owner can detect none of the characteristic symptoms of the disease. Nevertheless the blood may be swarming with trypanosomes. This is the stage in which there is hope of curing the animal and is also the stage which is of greatest danger to the herd, because of the danger of transmission by the fly.

The late stage of the disease, with the invasion of the central nervous system and its characteristic symptoms of paresis, is the one which is commonly recognized as *mal de caderas*. This phase is not of great importance, either from the point of view of treatment or prophylaxis. Even if the disease be checked, the horse or mule could probably not regain its normal condition. Moreover, these animals are not so great a menace to the herd as they were in the early stages of the disease, since the parasites have largely disappeared from the circulating blood.

It is obvious that if the disease is to be brought under control, it must be diagnosed in the early stages. We must recognize that if one waits until one horse in the herd develops paresis, it is more than probable that twenty horses are already in the early and highly infective stages of the disease.

Furthermore it is clear that the disease may be dormant in a herd of horses during several weeks or months when the horses are at pasture during the idle season. When the heavy work begins in the early fall, the severe exertion will bring about a rapid decline and in a short time the horse becomes paralyzed and is shot.

In view of these facts, together with the results obtained by treatment of the early stages of the disease with tryparsamide, two plans of prophylaxis were proposed for the ranches of the Paraguay Valley, which should prove of practical value in checking the extensive inroads made by *mal de caderas* each year.

PLAN A

1. Make a microscopic blood examination of all horses between December 1 and January 1 each year. Isolate all positive cases in a clean, short-grass pasture. (The tabanid is most prevalent in thick scrub.)
2. Take the temperatures of all well horses every two weeks from January 1. All horses showing a temperature of 39°C (102°F.) per rectum should have another blood examination, and all positive cases isolated and treated. The fortnightly

taking of temperatures should continue with the well horses until April 1.

3. Immediately on making the diagnosis, treat all positive cases with 8.0 to 10.0 grams of tryparsamide administered intravenously, repeating in two to three weeks. Three treatments of 8.0 to 10.0 grams should probably be sufficient. Horses under treatment should be isolated in a good pasture and should do no work. All horses, both those that are negative and those that have been treated, may be put together and worked at the beginning of the season, about April 15.

This procedure could be most satisfactorily carried out by a competent veterinarian who would remain on the ranch from January 1 to April 15. It would not be necessary for him to remain at the ranch during other seasons of the year. After one or two years, if found desirable, a personnel of young men might be trained in all the details of the examinations. They could then carry on the work, under competent supervision, at a much reduced cost. The most difficult feature of this plan, however, is the microscopic examination of the blood, which demands the skill of a trained technician.

PLAN B

In case it is not possible to make microscopic examinations, a less accurate but very practical method of prevention and eradication of the disease is as follows:

1. The rectal temperature of all horses should be taken by December 15. Any horse with a temperature of 39°C (102°F) or over should be considered as suspicious; immediate isolation should be instituted and daily temperatures taken for five or six days in succession. If the horse continues with a temperature of from 39° to 40°C , he should be considered as infected, and isolated and treated as in Plan A.
2. All horses with temperatures of less than 39°C may be considered negative, but should be examined every two weeks, as in Plan A, until about April 1.

This alternative method is not scientifically accurate, but is a rough and ready index of infection with *Tr. equinum*, since 99% of all fevers in the horses in Descalvados, between January 1 and April 1, are due to *mal de caderas*. This alternative method would probably not give the satisfactory or the permanent results that would undoubtedly follow the adoption of some such pro-

cedure as is suggested in Plan A, but it is suggested because it can be carried out without a specially trained personnel.

In addition to the above methods, directed specifically toward the treatment of infected animals, the following general measures should be carried out:

1. New horses should be brought from cadera-free upland zones. Horses brought from the lowlands may be carriers, and one infected horse introduced into the herd is a potential menace to the whole troop.
2. It is not necessary to carry out active and expensive destructive measures against infected rodents ("cavivara").
3. It is highly advisable to keep well horses on high ground in clear, short-grass pastures during the rainy hot season, in order to keep them away from the transmitting biting fly, (the "matuca").
4. It is not necessary to waste kerosene and disinfectant in destroying the dead bodies of infected horses, as has been the custom on many ranches. The parasite dies with the horse and the soil does not become infected with the disease.

Since the disease is of a chronic type, it is necessary to continue observations with the drug, tryparsamide, over a period of months or years. This paper is intended simply as a preliminary report in order that interested persons may know of the results of our early experiments.

SUMMARY

1. Single doses of tryparsamide of from 5.0 to 8.0 grams given intravenously to horses and mules suffering with *mal de caderas* are followed by a marked reduction of the parasites in the circulating blood. In a number of instances no trypanosomes could be found within 24 hours after treatment. In addition, there was a prompt cessation of fever and a pronounced physical improvement. In general the effect of such a dose lasted from one to three months.
2. The administration of two doses of 8.0 grams, separated by an interval of three weeks, was highly effective. The 24 horses so treated remained well and active for nine months while the five untreated controls had all died during the first three months.
3. No toxic symptoms or other evidence of constitutional injury were observed to follow the administration of tryparsamide.

On the contrary, pronounced general physical improvement was the rule.

4. The treatment of animals in late stages of the disease offers only a problematical measure of success, because of the marked involvement of the spinal cord, as evidenced by paralysis and also because of the poor physical condition of the animals.
5. It is suggested that the horse and mule may be the most important carriers of the disease and may serve as reservoirs of the infection from season to season.
6. Two plans of procedure for the treatment and possible eventual eradication of the disease in a herd are suggested.

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NIGHT CAMP

A horse to ride and a dog to love,
 And a fire to warm me by,
 End of the trail and high above
 The sweep of the starlit sky—
 And where is there more for a man's desire
 Than a horse and a dog and a pinewood fire?

The horse will bear me far and swift,
 And the dog will guard my rest
 When I lie me down on a dead leaf drift,
 Close to the brown earth's breast.
 But ah! the ache of an old desire,
 And the face that glows in the pinewood fire.

C. T. DAVIS in the *Arkansas Gazette*.

NOT IN SISSON'S ANATOMY

Professor: "When you examine a dog's lungs under the microscope, what do you see?"

"The seat of his pants, I suppose."—*The Pelican*

SOME AILMENTS PECULIAR TO THE THOROUGH-BRED AND HUNTER¹

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The vast proportion of ailments, to which the types in question are subject, constitute affections of the organs of locomotion and contiguous structures. The exigencies and demands of the thoroughbred, irrespective of his efforts being confined to flat racing, steeplechasing or hunting, incite claudications, some of which are associated with immaturity, faulty conformation or the two in conjunction.

Frequently horses showing the greater promise in their early, two-year-old form possess conformation which, although facilitating speed, predisposes to lameness and ultimately necessitates a let-up in training. From a clinical viewpoint, whether dealing with internal or external maladies, the predisposing causative factors take precedence.

From the breeder's standpoint, speed is bred to speed, with conformation and temperament frequently receiving secondary consideration. Early maturity and the display of extreme speed for a few furlongs are the requisites sought.

In view of the fact that the greater number of horses in training are two and three years old, it can be readily seen that immaturity ranks as the chief predisposing factor in the claudications of the thoroughbred. Fusion of the epiphyses, being incomplete until the horse is five years of age, furnishes a criterion of the developmental stage that other anatomical structures are undergoing, at a period when the greatest demands are being made upon the growing colt.

Length, lightness of forehand and obliquity of shoulder and pastern are to be sought in preference to uprightness of the latter, although the straight shoulder and upright pastern are more conducive to speed. Unfortunately such conformation detracts from the animal's aptitude to stand training, by inducing a maximum amount of concussion in the thoracic limbs. Lightness of the forehand is sought, as it enhances flexion and extension, while in the hunter the oblique shoulder and sloping pastern facilitate jumping.

The horse for flat racing should preferably be higher at the

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withers than at the croup; the reverse, however, is to be desired for steeplechasers and hunters. The latter type should also be well muscled over the loins, have powerful hocks and gaskins and a conformation capable of affording the maximum amount of propulsion. Length of neck and pelvic limbs is essential for both types as well as contour of foot and texture of pododerm.

Although several other points in conformation are important, for the sake of brevity attention has been confined to those having a more direct bearing on the locomotion characteristic of the types.

The degree of speed attainable at any given pace is directly proportionate to the instability of equilibrium in a forward direction, and it is with this object in view that the jockey's seat most adaptable for flat racing is poised directly above the withers and anterior to the center of gravity.

In the hunter and steeplechaser, jumping qualities and endurance are the prime requisites and speed takes a secondary consideration. To assist in procuring these qualities, the jockey's seat simulates that of the cavalry mount and is positioned posterior to the center of gravity.

The weight impost borne by the thoracic limbs, which are subjected to both the strain of propulsion and concussion in a horse traveling at extreme speed, in addition to the other causes previously cited, constitutes a potent factor in producing certain lamenesses peculiar to the thoroughbred.

The exciting causes of claudication in horses used for racing and hunting are identical with those in commercial pursuits, *i. e.* concussion, tensile strain and traumatism, but present themselves in a superlative degree.

With regard to the relative frequency with which structures are most commonly affected, we would group them as follows: First, the periosteum; second, muscles; third, ligaments; fourth, synovials; fifth, tendon sheaths; sixth, tendons; lastly, nerves.

We will proceed with a brief resumé of the several lamenesses occurring with relatively the greatest frequency in the types under consideration.

"BUCK SHINS"—"SORE SHINS"

Priority is given this periostitis of the principal metacarpal and metatarsal bones of horses two years of age in particular, as no colt of this age on the turf is immune. Occurring as a general sequence of training, it is customary to induce this condition in

all yearlings in the Fall prior to their two-year-old form, as its recurrence in the Spring is less severe, and early training is facilitated thereby.

The anterior face of the bones in question is the site of a periostitis, characterized by tumefaction and hypersensitiveness, extending practically the entire length of the bone, accompanied by an altered gait. The condition, as a rule, is more aggravated in the thoracic limbs, which in some instances present an affliction of the carpus and radius as well.

On Continental race-courses the claudication appears to have been associated to a certain extent with the influx of American riders, subsequent to the general adoption of the jockey seat first given publicity by Tod Sloan. In England and France the malady was far more prevalent than in Germany, but eventually its frequency became manifest in the latter country as well, through the same source.

The etiology is still somewhat in doubt. Some contend it is a periostitis primarily, while others hold to the view that it is associated with either an epiphysitis or a traction on the anti-brachial fascia.

The ailment calls for the application of rather severe cutaneous irritants, alcoholic solutions of biniodide of mercury being an example. If the treatment is not persevered in, the condition will be characterized by a recurrence in one or more limbs, or a prolonged course with the appearance of osteophytes upon the anterior face of the bones in question.

PERIOSTITIS AROUND THE PROXIMAL ATTACHMENT OF THE SUSPENSORY LIGAMENT

This condition is confined more to the steeplechaser and hunter than the horse raced on the flat. It affects the pelvic limb especially; while in the trotter the thoracic limb is subjected to the ailment. Although the trotter was not included in the types to be dealt with, in this paper, in view of the frequent occurrence of this lesion in that horse, we mention the fact. It is incited by the extreme length of toe plus the use of toe-weights, whose object is the lengthening of the stride, accomplished at the expense of tensile strain upon the proximal attachment of the suspensory ligament.

The demands made upon this inelastic structure are great, both at the time of contact of the heels, when the limb is completely extended, and at the breaking over of the toe in its last

point of contact with the ground prior to flexion. In the hunter and steeplechaser schooling at the jumps incites tensile strain upon the ligament, and in the flat horse schooling at the barrier is a potent factor.

In the pelvic limb a tumefaction is noted at the proximal attachment, while in the thoracic limb this is absent. In either event, the carpus or tarsus, as the case may be, is imperfectly extended or flexed. In this instance palpation is of diagnostic value, as this is one area few laymen palpate prior to procuring a qualified opinion.

The lameness tends to recurrence more frequently in the trotter than the thoroughbred, because the length of toe and the wearing of toe-weights is erroneously considered essential to an acquired gait, and constitute an ever-present, predisposing cause, subsequently producing sub-carpal osteodynia.

PARENCHYMATOUS MYOSITIS

This caludication of myopathic origin is confined to the glutei, longissimus dorsi and extensors of the knee and elbow principally; is parenchymatous in type and essentially functional.

The condition accompanies excessive exertion and is nearly as prevalent as "bucked shins." It is associated with an unbalanced metabolism, in which the fatigue products are eliminated with insufficient rapidity, and is characterized by rather profuse perspiration, hypersensitiveness, inability of the affected muscles to functionate properly and the occasional presence of transient hemoglobinuria.

This type of myositis, therefore, responds to an eliminative form of treatment; diuretics generally sufficing, although in isolated instances laxatives are also required. Local applications are of secondary consideration.

The possibility of a too hasty "cooling-out" process is to be avoided, and a temporary lessening in the amount of work required of the horse is a requisite. The condition is frequently spoken of as "cording" or "cording-up."

SPRAIN OF THE PHALANGO-SESAMOIDEAN LIGAMENT

This lameness constitutes one of the more frequently occurring ligamentous derangements of the two-year-old thoroughbred and is practically non-existent in other types and aged horses. Being one of the most acute lamenesses to which the horse is heir, its nature is such that it completely incapacitates the horse for a protracted period. An animal will develop the condition

in a thoracic limb in the midst of a speed trial, necessitating his being brought to a walk and frequently the rider dismounting.

Comparatively little ability is necessary in diagnosing the condition as a foot lameness, but the inexperienced have frequently assumed that a navicular bursitis is the cause, and have performed plantar neurectomy. Subsequently, much to their surprise, the hyperthermia in the foot could not be accounted for. The lameness responds to a treatment consisting of complete rest and such antiphlogistic applications as hydrotherapy and poulticing. It is practically non-recurrent. On the course it is designated "spread foot."

INFLAMMATION OF THE ANTERO- AND POSTERO-LATERAL LIGAMENTS OF THE CORONET

This claudication is predisposed by upright pasterns, which induce unparallel hoof and phalangeal axes, associated with the fact that the weight impost borne by the horse incites fixation of both coronary and pedal articulations.

The acute form of this ligamentous affection is nearly as painful as the phalango-sesamoidean ailment, but there is a tendency to a slowly progressive type of inflammation, accompanied by calcification and the development of osteophytic deposits at the site of ligamentous insertion, with the ultimate formation of peri-articular ring-bone in given cases.

With the presence of exostosis the lameness frequently subsides, but if calcification of ligaments ensues, which is the frequent sequence, volar flexion and a mechanical impediment in locomotion become permanent.

SESAMOIDITIS

The sesamoidean apparatus constitutes the chief shock-absorbing mechanism in the thoracic limbs of the thoroughbred in active training. Together with the fact that the metacarpophalangeal articulation is normally in a condition of over-extension, the frequency of this claudication is second only to "bucked shins" and parenchymateous myositis.

LIGAMENTOUS SESAMOIDITIS

In view of the fact that the superior sesamoidean ligament, together with the perforans tendon, are subjected to tensile strain when the muscular portion of the phalangeal flexors fatigues, either during intensive training or when hard pressed in racing or hunting, the phenomenon of concussion presents

itself in a superlative degree. This results in ligamentous sesamoiditis as one of the most prevalent lamenesses.

Contrary to textbook teachings, hyperthermia and hypersensitiveness are usually absent. This results in a diagnosis being arrived at only after seeing the horse at a fast pace exhibit a slight degree of volar flexion, which is usually bilateral, as the tendency is for both ankles to be affected. If one ankle only is impaired, as a rule the other will be likewise, at a not far distant date. This type of the disease is amenable to treatment in many instances, though all too frequently it assumes a chronic course.

The sub-acute type may be associated with either a thecal, capsular or bursal synovitis, but ultimately the chronic nature of the malady becomes manifest as osseous sesamoiditis.

OSSEOUS SESAMOIDITIS

This caludication partially incapacitates more thoroughbreds than any other lameness to which this horse is subject, and prevents him from extending himself to the utmost on a dry, fast track.

It is this condition, associated with arthritis deformans, a certain degree of joint contracture, and rarefying ostitis, which is accompanied by tendinous rupture, and characterized by a tearing loose of the branches of the suspensory ligament from the attachments to the sesamoid bones. This constitutes one of the most hopeless types of "break down." A certain degree of volar flexion may or may not be present at a slow pace, but is always evident during rapid locomotion.

Firing has been, and will continue to be the most popular form of treatment to employ, but the prognosis is that of the spavin group of lamenesses.

SYNOVITIS

The synovials of the horse under consideration are subject to lesions, principally of the thoracic limbs, and are capsular, bursal and thecal in type. Tarsitis being comparatively infrequent, we will confine our attention to its parallel in the anterior limb.

CARPITIS

Carpitis, or intercarpal osteo-arthritis, is predisposed by upright shoulders and pasterns, and is analogous to spavin, although the generic term "spavin" signifies a hock affection. When dealing with thoroughbreds one is impressed with the frequency of spavin of the knees.

Frequently subsequent to chronic sesamoiditis, the carpus assumes a compensatory role in shock absorption, which results in intercarpal osteo-arthritis. This ailment, which is equally rebellious to treatment as intertarsal osteo-arthritis, is characterized by a peculiar rotary and abductory type of locomotion.

In its incipency, carpalis in the thoroughbred requires a display of diagnostic ability to recognize its presence, as it is unassociated with traumatism, which constitutes the paramount cause of this lameness in the draft types. Here again hyperthermia, hypersensitiveness and abrasions are absent, and the "cooling out" process affords little criterion; the animal must be seen extended, as in diagnosing sesamoiditis.

The lameness is due in many instances to osteophytic encroachment upon the inter-articular aspect of the bones, and palpable exostosis is frequently absent. The prognosis is usually about as unfavorable as other types of arthritis deformans.

Partial ankylosis, the general sequence of intercarpal or intertarsal osteo-arthritis, detracts from the thoroughbred's usefulness relatively more than from that of the horse in commercial pursuits.

TENDON AND TENDON-SHEATH AFFECTIONS

Primary tendo-vaginitis is of frequent occurrence in the Spring subsequent to the influenzal and contagious pleuropneumonic infections.

Weather conditions permitting, attention is focused on the early Spring form of the new crop of two-year-olds, and training frequently begins before the tendon sheaths and tendons have regained normal tone, as scarcely a two-year-old passes through the Spring months without an attack of laryngitis, pharyngitis, or more serious infection of some portion of the respiratory tract. This leaves the structures in an atonic state, and a resulting primary tendo-vaginitis makes its appearance, with relative frequency in inverse ratio to the length of convalescence permitted prior to training.

The condition usually yields to simple treatment with rest and antiphlogistics, but frequently, in a few weeks of intensive training, secondary tendinitis supervenes.

TENDINITIS

This affection unfortunately is not confined to an inflammation of the tendon, but more frequently than supposed presents itself

as a fibrillary rupture, characterized by serous infiltration into the sheath, so-called "bowed tendon."

Hunters and steeplechasers are subject to tendinitis induced by passive strain, while flat horses are usually the victims of a tendinitis incited by active strain. However, both types of strain may act in conjunction, as in a co-existing sprain of the flexors and the suspensory or check ligaments.

Fibrillary rupture in the proximal third of the metacarpal region is frequently associated with a lesion of the check ligament, or a bursitis of the flexor pedis; while that in the distal third is usually accompanied by a tendo-synovitis and possible lesions of one or more sesamoidean ligaments.

Lesions in the middle third present a more favorable prognosis, being due to tensile strain, unassociated with a conformation diathesis, and assisted during the reparative process by the supportive property of the paratendineum.

Although much dependence has been placed on line-firing as a standard treatment for "bowed tendons," a year's rest, plus the periodical application of a cutaneous irritant, preferably mercurial or iodine in content, will satisfactorily accomplish the liquefaction and subsequent resorption of inflammatory exudates, where results are of paramount importance and time is of secondary consideration.

In a sound horse, undergoing development as a hunter or jumper, the tendency, generally speaking, will be for lesions to appear in the proximal third of the metacarpal region; while in the flat horse the middle and distal third are the more likely locations.

We qualify our statement, because many steeplechasers and hunters have, on some prior occasion, during flat racing, developed sesamoiditis, ligamentous or osseous.

If an entire horse, with conformation suitable for jumping, should have his usefulness impaired on the flat, such an animal will in many cases train sound, even though subjected to twice the distance to which he was accustomed, after being castrated, thereby removing considerable impost supported by the thoracic limbs, together with the readjustment of weight in the changed seat of the steeplechase rider, plus a minimizing of concussion by diverting his efforts from the track to the turf.

The impetuous temperament of the stallion is quite a factor in aggravating lesions that otherwise might have been trivial and responded readily to treatment; his dogged nature often

undoes the efforts of months which frequently can be overcome as stated.

PARTIAL OR COMPLETE SEVERING OF THE SUPERFICIAL AND DEEP FLEXOR TENDONS IN THE PELVIC LIMB

This condition is confined usually to horses racing on the flat, the accident occurring when a field of horses is closely bunched, and for various reasons a rider takes a horse back suddenly. The horse in his rear, traveling at such momentum that he can not be immediately controlled, steps on the metatarsal region of the extended pelvic limb of the animal impeding his progress, resulting in partial or complete severing of one or both flexors of the phalanges.

Partial rupture yields admirably to treatment, but a completely severed deep flexor tendon in a hypersensitive individual, such as the thoroughbred, is generally unsatisfactory to treat, as the horse does not take kindly to the application of a brace. In addition to the poor regenerative power of tendon and the usual complication of pyogenic infection, the use of sutures does not facilitate healing.

EXTREME DORSAL FLEXION OF FETLOCKS IN THE PELVIC LIMB

This malady is met with infrequently in the flat horse and trotter, being due to relaxation of the phalangeal flexors and superior sesamoidean ligament, occasioned by undue tensile strain. It is characterized by the fetlocks, in the region of the ergot, coming in contact with the ground during locomotion at extreme speed. These structures, which concur in supporting the angle of the metatarso-phalangeal articulation, become relaxed to the extent of permitting the degree of dorsal flexion stated.

The use of protective boots, after a let-up in training, together with special shoeing, adaptable for speed trials only, constitutes rational treatment. A recurrence, however, is to be anticipated with the resumption of intensive training.

TENDINOUS CONTRACTURE

Developing as the sequence of a multiplicity of lesions in the digital region, associated with volar flexion as the predominating feature, this condition is usually designated "contracted tendons."

We are inclined to view the greater number of cases as myogenic and not tendogenous, considering the myopathic disturbance

as being atrophic in character, and analogous to that occurring in contracture of the flexors of the carpus.

While it can not be denied that contracture specifically tendogenous is encountered, associated with either cicatricial contraction or adhesion, we venture the opinion that practically all cases are unassociated with any tendinous lesion, and that atrophy of the muscular portion of the flexors is responsible for the clinical appearance.

Contracture of the suspensory ligament is also not an infrequent cause of knuckling, simulating tendinous contracture, but the presence or absence of tenseness in this structure will reveal the possibility of its being an incriminating factor. Tendinous contracture, developing subsequent to a painful ostitis, bursitis or synovitis in the phalangeal region is essentially myopathic.

The mature horse subjected to fast paces does not tolerate tenotomy as does the colt with congenital contracture, or the horse in commercial pursuits; and median neurectomy which has restored to usefulness so many horses at a slow pace, is not borne well by an animal which must of necessity exert a supreme effort with an impost supported principally by the thoracic limbs.

The treatment of this affection under these conditions is unsuccessful, by reason of the limitations placed upon it.

TENDINITIS AND BURSITIS OF THE GLUTEUS MEDIUS

Inflammation of this tendon and its subtendinous bursa is associated principally with hunters and steeplechasers, being induced by falling with the pelvic limb in the phalangeal region momentarily caught in the obstruction over which the horse is jumping.

The frequency with which a horse may misjudge a jump in taking off prior to clearing it, is the usual cause of this condition, which is characterized by a peculiar adductory motion of the limb, making diagnosis a simple matter.

The tendency to chronicity bespeaks a guarded prognosis. Injections of turpentine preparations with iodine content usually restore the atrophied muscle to its normal rotundity; but upon the resumption of training the myopathic phenomena frequently recur, indicating that the lesion has not yielded to treatment. Horses so affected will not stand training.

There is, however, a certain percentage of recoveries attending this procedure, which is the most rational surgical intervention to pursue.

BURSITIS PODOCHLOREARIS

Navicular disease in the thoroughbred has a tendency to manifest itself as a circumscribed affection of the bursa in question. In the initial stage a shortening of the stride, associated with an occasional tendency to stumble, absence of contraction of the heels, and in isolated instances local hyperthermia characterize this claudication.

The narrow foot so frequently associated with well bred horses particularly predisposes to this lameness, and concussion at its maximum incites it.

The most efficient treatment for this condition is digital neurectomy. There has been an inclination for the profession to refrain from performing this operation, which is a specific indication in the circumscribed form of the disease.

The ailment is frequently sub-acute and associated with a certain degree of contracture of the heels when first presented for a diagnosis, and in such instances if the best results are desired, a restoration of the foot to its normal contour prior to operating is advisable.

The impression held by some, that contracture of the heels is usually indicative of navicular disease, and the view of others, that it is a clinical entity, are both erroneous; as a methodical examination of the anatomical foot will frequently reveal a specific cause for the contracture distinct from navicular bursitis.

SUPRASCAPULAR PARALYSIS

Of the neuropathic disturbances to which the thoroughbred is predisposed, suprascapular paralysis is the lone representative, isolated cases being encountered in the steeplechaser and hunter.

This horse, in jumping, frequently clears the obstacle with one fore limb, while the other comes forcibly in contact with the obstruction; the impact being such that the limb is forced violently backward, producing this nerve lesion, with paralysis ensuing in short order. Collision between a horse minus his rider and another contestant, is a possible though far less frequent cause.

A characteristic abductory type of supporting-leg lameness develops, attended by atrophy of the supra- and infraspinati muscles, with a protracted course. The claudication is benefited by rest and massage, yielding to treatment, however, in comparatively few instances. The value of braces or harness for fixation purposes is problematical.

LONGITUDINAL FRACTURE OF THE OS SUFFRAGINIS

Fracture of the first phalanx presents itself in the form of a longitudinal fissure, this being practically the only type of fracture met with in thoroughbreds. This ailment appears to be of far more frequent occurrence on the European turf, where a number of horses are retired from training for varied periods of time, the diagnosis being "split pastern." Incomplete fractures of this type make good recoveries, eventually training sound.

It is quite possible that certain breeding sections of Europe predispose a horse to rachitic or osteomalacial deficiencies and incite this fragility of bone. We have had occasion to see individual cases which had been retired from training, the diagnosis having been made on the courses in England in particular, and the animal shipped home to this country. In practically every instance sesamoiditis appeared to be the claudication that impaired the animal's racing qualities.

The horses manifested bilateral lameness, both fore limbs being equally impaired; this, however, does not preclude the possibility of both conditions having been present at the time of the first inspection. The application of a plaster-of-Paris cast is necessary, recovery in eight weeks being the rule.

GENERAL STATEMENTS

This constitutes a brief resumé of the lamenesses peculiar to the types under consideration. Several general statements are to follow, including a brief consideration of a few internal and external maladies of daily occurrence.

Generally speaking, the claudications of the thoroughbred and hunter are characterized in the thoracic limb by a hyperplastic type of inflammation and are essentially chronic; while those in the pelvic limb are sero-fibrinous in type and essentially acute.

The several hydrarthroses and hygromata are usually associated with horses of more lethargic temperament and those denied the comforts of a box-stall, and occur with relative infrequency in horses used at a fast pace.

Transient lamenesses, traumatic in nature, due to the animal striking himself, are less frequent in speed horses with a natural gait. Acquired gaits, such as the trot, where several theories relative to shoeing and balancing, together with the necessity for wearing different types of protective boots are co-related, furnish the greater number of cases.

The thoroughbred is also at a disadvantage, as compared to

the trotter, respecting one feature of lameness, as the latter frequently alleviates his own claudication by transposing his gait from the trot to the pace and continues to perform with approximately the same efficiency.

The field for neurectomies is confined to the flat horse principally, as the hunter and steeplechaser require tactile sense in an unimpaired degree; therefore it is not feasible to perform the operation in the two latter types.

Median neurectomy, though ideal in alleviating the lameness associated with sesamoidean lesions and tendinous contracture in horses at a slow pace, is contra-indicated in a thoroughbred, as a horse with an unnerved ligamentous or tendinous affection will train but a limited time prior to hopelessly breaking down.

Digital neurectomy, already alluded to, has a given field of usefulness, but the vascular disturbances attending the "high" operation, when associated with traumatism at a point distal to the operative field, make it rather hazardous to use as a routine procedure, though many horses stand training for indefinite periods subsequent to its performance.

Firing will always be a standard procedure in the treatment of many sub-acute and chronic lamenesses. Although having surgical limitations, much is anticipated from its employment.

The value of rest, previously referred to as an adjunct in treating lameness, is amply demonstrated, as with the cases at hand. A year or more of inactivity is frequently permitted and the favorable result attending this is evident upon the resumption of training.

Horses undergoing the "rest" treatment for protracted periods should have the feet inspected by a competent shoer at regular intervals; the excess growth of horn removed and the foot balanced as though preparatory to plating.

INAPPETENCE

Incited by the general hypersensitiveness characteristic of thoroughbreds, this condition is associated with many cases of so-called "bad doers."

Many horses refrain from eating the full allotment of rations because of this nervous disorder, manifested by stall-walking and a tendency to unrest.

The corrective measures consist in obstructing the animal's view of other horses undergoing training, preparing a variety of tempting foods, the administration of laxatives, antacids, and at

times mild sedatives, preferably the bromides. The malady disappears spontaneously with the discontinuance of training.

DENTAL ANOMALIES

Irregularities in dentition are associated with all horses two and three years of age. These are encountered in the development of enamel points, the shedding of temporary molars and incisors, eruption of supernumerary teeth and their necessary removal, together with stomatitis the logical sequence.

Eliminating the exciting cause, in addition to antiseptic, mild astringent, and at times caustic applications to given foci, constitutes rational treatment.

The occurrence of these conditions occasionally causes the animal to bear out during speed trials, but this tendency on the part of a horse—too frequently attributed to irregularities of dentition—is due in reality in many instances to the presence of incipient periostitis, which ultimately is associated with the appearance of a given lesion.

DERMATITIS OF THE PASTERN REGION

Of the less serious yet troublesome ailments to which horses in training are subject, this dermatitis, generally referred to as “cracked heels,” is of a common occurrence.

Flexion surfaces of articulations are more sensitive than other regions of the limb, and this together with the daily use of leg and body washes, which gravitate to this point, associated with the hypernitrogenous state of the system, incite acute attacks constituting one of the most rebellious forms of dermatitis one has to treat.

As it usually manifests itself as an acute exacerbation of a chronic affection, the several remedial measures afford temporary relief and consist in the use of antiseptic, antiphlogistic and mild caustic applications.

When the lesion reverts to a phlegmonous malady, due to chronicity, biniodide of mercury will promote cicatrization.

ACNE

The second dermatitis makes its appearance as a “summer rash,” associated with a diet rich in concentrates during the intensive training period; being widespread in Summer and abating as Fall approaches.

Although confining itself to no one portion of the body, certain attacks are characterized by a vesicular eruption in the girth

region where abrasions and chafes occur. The contents of the vesicles are transferred through the medium of rub-cloths and girths to other horses. More frequently, however, the nodular type of the disease is present.

The local application of astringent and antiseptic remedies, plus the administration of antacids, gives satisfactory results although certain cases run protracted courses. The derangement is to be distinguished from contagious pustular dermatitis when the vesicular outbreaks occur.

We have endeavored to cover the subject assigned with brevity, and trust that the practitioner may benefit thereby.

GREASEWOOD SOMETIMES POISONOUS TO SHEEP

Greasewood, a shrubby plant very plentiful on the range in some parts of the West, has been the cause of occasional large losses of sheep. This plant was listed as poisonous twenty-five years ago, but only recently have investigations been made by the United States Department of Agriculture which brought out definite information concerning the symptoms and the conditions under which poisoning will occur. The results of this work are contained in Department Circular 279, entitled "Greasewood as a Poisonous Plant."

The investigations have established that under most conditions this plant is a good forage for sheep, and dangerous when it is taken in considerable quantities, at least 1.5 pounds to the hundredweight of animal, in a very short time. Losses may be prevented by taking care that sheep do not graze too long on greasewood when they are very hungry. Animals that once show the symptoms usually die; in other words, a quantity of the plant which will cause the symptoms will cause death.

The greasewood plant, which is sometimes known as "chico," is light-green colored, scraggly, with spiny branches and slender, fleshy leaves about 1½ inches long. It is commonly recognized by western stockmen, but there are several other plants sometimes called greasewood.

Copies of the circular may be obtained without cost, as long as the supply lasts, by writing to the Department of Agriculture, Washington, D. C.

THE LIVE STOCK INDUSTRY OF ILLINOIS¹

By W. S. CORSA, Gregory Farm, White Hall, Ill.

Among the many notable conferences held at this Home of Conferences, two of special significance were held on January 27th past, when the Live Stock Conference and the Dairy Conference were held here at the University. Both conferences were called at the instance of the Illinois Agricultural Policy Committee, in its effort to map out an agricultural plan which will help to meet the developing situation for Illinois for a limited period, say for the next twenty-five years.

The members of your Association, in such intimate touch with agricultural conditions, have no doubt also sensed the changes that have occurred and those impending in the economic conditions of Illinois. I might mention the increase in urban population, until now the majority of our citizenship dwells in the cities, the increase in tenantry, the threatened annual depletion of soil fertility, because of grain farming, the increase in manufacturing due to our favorable central location for markets and proximity to cheap fuel, and the further impetus to manufacturing through the almost certainty that transportation will be cheapened by improved waterways.

THE PROBLEM

The query naturally arises, what will the farmer do, not only to maintain his position agriculturally, but to take his part in the wonderful development of our commonwealth that lies ahead. It must also have raised similar question in the minds of members of the Illinois State Veterinary Medical Association. To my mind it opens up a wider life, more responsibilities, and larger opportunities for all of us—farmers and veterinarians alike. For the problems can not be met by either one without the other. And in their successful solution will come our mutual reward—sustaining and protecting the lives of the increasing citizenship is our job. This will be accomplished largely through an agricultural policy which recognizes the beneficent influence of live stock in maintaining soil fertility, profitable agriculture, and as providing a desirable dietary. To this end the services of the veterinary profession are indispensable.

At the conferences to which I have alluded papers were read

¹Delivered at the fourth annual Veterinary Conference, University of Illinois, July 10-11-12, 1923.

by men who have had peculiar and special opportunities for investigational work with live stock and so I believe I am rendering this Association a far greater service by even briefly and inadequately drawing for your information upon the findings of these authorities, than by giving you my own extremely limited viewpoint relative to the live stock situation in Illinois.

Professor Case made clear that "at numerous places and on numerous occasions someone has pointed out that with the growth of population and greater demands for food, meat production must be replaced in large measure, if not almost wholly, by dairy, grain, vegetable and fruit production." It has been shown that "(1) one-third of the total land area is suited only to grazing purposes, (2) that live stock received probably eighty percent of the total food and feed produced on both improved and unimproved land and unimproved pasture, and (3) that a considerably increased production is possible without changing our diet. There is little reason, therefore, to expect any great reduction in meat production, even with a considerable increase in population. That we might expect no decided decline in total live stock production, because of population increases, finds solid support in the fact that Germany, with 133 people per square mile in 1914, had three times as much live stock per square mile as the United States with only 35 people per square mile."

MORE LIVE STOCK PER ACRE

It would seem "that as population increases, live stock will not increase in like proportion, but that live stock may be expected to increase with reference to total land area."

Most of the papers at these conferences fairly bristled with statistics. It will require more space and time than this paper affords to bring them all into harmonious array. "The census figures for 1920," Professor Rusk informs us, "show that while Illinois ranked eighth in total number of beef cattle, she ranked thirteenth in number of beef cows and heifers. In spite of these facts Illinois still has a significant industry in her beef cattle breeding operations and there has been some increase in interest during the last few years."

"Illinois, special problem in feeder cattle production is upon her vast tracts especially suited to production of grain. Under such conditions the results to date, in a sweet clover and stover silage system of maintaining a breeding herd, would indicate that under favorable conditions one breeding cow can be carried

practically the year around to every four acres in the rotation, without taking a single acre out of the cropping system or using a single bushel of harvested grain." "These results, Professor Rusk believes, "are indicative of great possibilities for Illinois in the maintenance of breeding herds on the by-products of her best system of farming and thus in a large measure solving her feeder cattle problem."

In treating of the horse situation in Illinois, Professor J. L. Edmonds opened a battery of statistics drawn from the arsenal of the U. S. census. The disclosures showed a shortage of 67,000 horses and a surplus of 1,217,000 mules on farms in the United States in 1920, as compared with 1910. In cities a shortage of 1,477,178 horses and a surplus 107,879 mules for the same period. On farms in Illinois a shortage of 156,035 horses, and 20,441 surplus in mules. In cities of Illinois a shortage of 115,463 horses and a surplus of 7,380 mules.

STALLION REGISTRATION

In 1910 there were licensed in Illinois 9370 stallions and jacks, while in 1920 only 4365 were licensed. "Live stock survey figures collected and compiled by the Illinois Agricultural Association on the colt crop of Illinois, in the quarter from April 1 to July 1, 1920, show some startling results. On 32,515 farms in 43 counties the number of horses and mules reported on July 1 was 238,546, of which 45,412 were designated as brood mares. In the three months named, a period in which nearly all the colts for the year are foaled, these mares dropped 8,918 colts. This seems to mean that only one brood mare in five foaled a colt that year. Allowing nothing for losses, which probably outnumber the colts foaled outside the quarter, the figures also indicate that at this rate of breeding it would require 27 years for the farms of Illinois to reproduce their present horse and mule power."

While "the statistics seem to show that the number of horses and mules on farms in the United States more than held their own from 1910 to 1920, in Illinois the 20,000 gain in number of mules did not, however, equal the 156,000 decrease in number of horses." "Cheap horses, cheap feed, high freight rates, and high industrial wages are reckoned as favorable to the use of horses." "Good rotations (of crops) and live stock farming make the use of horses more advantageous."

"The U. S. Department of Agriculture investigations indicate

that each tractor has displaced approximately two horses. Illinois Bulletin No. 231 concludes that on the average corn-belt farm, growing less than 240 crop acres, the horse cost can not be reduced enough to offset the cost of operating a tractor."

"In 1919 and 1920 the studies of records of 74 Indiana farms, by the Purdue Department of Farm Management, showed considerable more profit on the non-tractor farms. In 1921, studies of 100 farms in Woodford County, Illinois, by the Farm Management Department of the University of Illinois, showed a considerably smaller loss in net income on non-tractor farms, as compared with tractor farms."

"The advantage of a useful type of work horse over a non-descript is not at all fully or very generally appreciated. It is estimated by those in charge of the Central Remount Purchasing and Breeding Zone of the U. S. Army that of the horse population in this district, forty percent are nondescripts of no special value." What we need to produce are horses which have jobs.

MCLEAN COUNTY SYSTEM

The outstanding development in swine production in Illinois in recent years revolves around the scheme of sanitation as developed by your fellow veterinarian, Dr. Raffensperger, in McLean County. This method which so accords with common sense treatment and fits in so well with desirable crop rotations, and justifies itself by results, will no doubt renew and increase pig raising in Illinois—especially in the central and northern part of the state. Illinois still drags about half-way behind Iowa with her approximately 10,000,000 hogs. Perhaps the reason lies in the fact that Illinois stands first in shipment of corn—a position of which she need not feel altogether proud.

In these times of farm surveys the general impression has been confirmed by investigation that diversified live stock production goes hand in hand with desirable crop rotation. However, apart, but in addition, it would seem that the sheep industry should be materially increased in Illinois. Mr. Kammlade informs us that this state in the year "1867 had an estimated sheep population of 2,764,000—a number far in excess of the number at any subsequent time. On January 1, 1920, Illinois, with 637,685 head, ranked 19th among the states. Less than one farm out of every thirteen in 1920 reported sheep.

"Iowa has but one and one-half million acres more than Illinois. Her sheep population was 400,000 greater, even though the

number of swine and beef cattle exceeds the number in this State by several million head. In 1920 more than 260,000 feeder sheep were sent to feed-lots and farms in Illinois. That same year there were in Illinois 423,000 ewes one year old or over—in other words, ewes of breeding age. The total number of pure-bred sheep of all breeds, both rams and ewes, was over 13,000. If all the pre-breds were rams of breeding age there would be one pure-bred ram to thirty-two ewes.”

“Farmers who keep sheep often fail to realize that wool yields approximately one-third of the total income from a flock.” And veterinarians fail, I fear, to realize that the encouragement of the farm flock means a cash crop of wool from which to pay for vaccinating the spring pigs. For years the veterinary profession apparently concentrated its attention upon the horse, and well indeed did that noble animal deserve all the attention he received from the veterinarian and more than he received from the farmer. But the time has long since been here when the so-called humbler animals of the farm, the hogs, the sheep, and the chickens, demanded the best thought and care of the profession and the layman if we would serve our own best interest.

INTEREST IN POULTRY

This spring I had the good fortune to be a visitor for a day at the meeting of the Missouri Valley Veterinary Association, at St. Joseph, Mo. Of the several clinics, the one devoted to chickens unquestionably aroused the most active and sustained interest of the membership of that Association that day.

At this point I may say that along last month, when the wife of the speaker took only a week's vacation from home and left me as guardian and caretaker of her feathered pets, I acquired hourly information and experience, that of itself almost made me long for her return. However well informed you gentlemen may be relative to the “Poultry Flock as a Productive Enterprise on Illinois Farms,” it is ventured that you will be enlightened by Prof. Card's treatment of this subject.

In number of chickens on farms, Illinois has consistently held second place among the 48 states as indicated by the Federal censuses of 1900, 1910, and 1920. From over sixteen and one-half million chickens in 1900, the number had increased to twenty-five millions in 1920, an increase of 51%.” In “Illinois the apparent production for 1921 was 30,000,000 chickens and 116,000,000 dozen eggs.”

In 1920 the state average was 106 chickens per farm. Prof. Card believes "there is a place for a flock of 200 to 300 hens on many Illinois farms." To do this would, of course, put poultry as a distinct farm enterprise of considerable magnitude.

In my day at St. Joseph I gathered the very distinct impression that many of the practitioners present were specializing not only in the treatment but in the care of poultry. And in this day of the decline, but not the fall, of the horse as a source of farm and professional revenue, may we not all of us consider seriously opportunities which possibly heretofore we have overlooked.

The Dairy Industry of Illinois is rightly recognized as one of the state's major activities.

"On the basis of the 1920 census figures and the reports of the Bureau of Agricultural Economics, Illinois ranks fourth in the total number of dairy cattle, sixth in the value of dairy products sold, eighth in the amount of factory butter made, fourth in the amount of condensed and evaporated milk manufactured." So that, according to Mr. H. A. Ross, "Illinois comes well within the half-dozen states leading in dairying." And this in spite of the fact that "on the basis of the last census the average production of cows in Illinois is only 3,044 pounds." On this showing our gain in number of cows from 1910 to 1920 was ample, though it was less than one percent in the ten years, or in stated numbers 9,777, while Wisconsin gained 372,000 cows in the same time." Illinois plainly needs better cows and more of them.

TUBERCULOSIS GREATEST MENACE

Dean Russell, in his scholarly paper on "What Animal Disease Control Means to the Future of Dairying," flatly stated that "Tuberculosis is the greatest disease menace that we have to the dairy industry." Following the introduction of the tuberculin test, in 1892, "the next step in the development of control measures was to give a clean bill of health to those herds which freed themselves, by testing, from any suspicion of the disease."

A well merited tribute is paid to Dr. Dyson, of your Association, for his part in originating the idea of the Accredited Herd, which idea was promptly put to work in other states and later organized on a national basis by the U. S. Department of Agriculture. And from this flying start what has Illinois been doing?

Permit me to quote from Dean Russell further. "In the various states there were in December, 1922, 22,312 herds embracing

479,000 head that had been fully accredited. Wisconsin and Minnesota lead in this work with 47,000 and 45,000 respectively, while Iowa and Indiana follow with about 35,000 each. Illinois had 9,014 on this date.

Entirely apart from the risk to the human family, a subject of the first importance, come the costs of tuberculosis, one of which has assumed alarming proportions, for, as the Dean informs us, "of the 37 million swine killed in 1921, 12.5 percent were found affected." It was surprising to learn "that while tuberculosis is no respecter of persons, bovine tuberculosis is a respecter of political boundaries. The intangible line which separates Northern Illinois from Southern Wisconsin is a dead-line that in some way checks the onward march of this disease. For the United States official records, together with the records from the Wisconsin State Department show that the northern tier of Illinois counties contain nearly four times the tuberculosis as the contiguous Wisconsin counties.

A CONSTRUCTIVE POLICY

Undoubtedly disease control has never been more startlingly important in Illinois than it is today. At our Conference in January, Dr. Graham recognized this condition in his valuable paper, "A Constructive Policy for the Control of Animal Diseases." He opens with the very fair statement, "In preparing a few remarks appropriate to this Conference I have been guided by the thought that the control of animal disease is a peculiarly cooperative, complex function."

"It should be made clear," he continues, "that the ultimate suppression of animal diseases, the loss from which approximates upwards of twenty million dollars annually in Illinois, is in no way assured by the mechanical ability to administer hog cholera serum, the feeding of a worm capsule, or the dispensing of a remedy."

"During the last three years over 10,000 specimens have been received for laboratory examination. A tabulation shows that swine diseases comprise 48.78 percent of the laboratory diagnostic material, feed and miscellaneous materials 28.75 percent, cattle diseases 12.51 percent and poultry diseases 11.44 percent.

"The source of the specimens for diagnostic work has afforded an interesting study from the standpoint of disease control and gives some idea of the activity in this field. Forty-nine percent of the diagnostic material received last year was from veteri-

arians; from miscellaneous sources, including physicians, manufacturers, and experimental sources, 40 percent; farmers submitted 7 percent while the farm bureaus are responsible for 4 percent of the total.

"The animal loss from preventable disease may be reduced by steady and unflinching labor through cooperation of the owner, the veterinary practitioner, and the investigational laboratory, in applying our present knowledge and accumulating new truths."

Again, the continual pressure being exerted upon domestic animals to yield the most energy in flesh and milk is closely associated with the morbidity in some herds and flocks. The problem of food requirements becomes more and more apparent in connection with certain losses and we are encountering conditions referred to as dietary deficiency diseases. The field of infectious diseases then becomes but a part of our problem. Further attention must be given to the parasitic and protozoan diseases which are so prevalent in our herds and flocks, together with their relation one to another, and the possibility of their influence on the different specific infectious diseases.

"What constitutes or defines susceptibility to disease, what are the forces upon which it depends? These obscure factors, if known, might greatly modify our present practices."

NEW METHODS BEING DEVELOPED

"In disease control work new methods are being developed and in this field we find that veterinarians and farmers, like physicians, must be refreshed by scientific meetings or by graduate training."

"The responsibility of the veterinarian is to teach the basic principles of preventive medicine in his community, the value of rotation of pastures and disinfection of premises in disease prevention."

The first step in "A constructive policy in the control of animal diseases would involve the proper teaching of the farmer, the veterinarian and the public, of the relation between human and animal diseases and what can be accomplished by proper preventive measures."

Nineteen thousand insects are required to make one pound of cochineal dye. Only the bodies of the females are used. They are wingless and each one produces over 1,000 young which spread over the plants rapidly.—*Dearborn Independent*.

THE ORGANIZATION AND WORK OF THE FEDERAL BUREAU OF ANIMAL INDUSTRY¹

By W. N. NEIL, *Chicago, Ill.*

Meat Inspector, Bureau of Animal Industry.

The organization and work of the Federal Bureau of Animal Industry as a whole was presented by Dr. U. G. Houck to the Illinois Veterinary Medical Association at the time of their last regular meeting in Chicago, and do doubt many who are now present heard Dr. Houck's paper on this subject. For the reason stated and because of the limited time allotted for this paper, it is considered best to confine myself largely to the organization of the Bureau and its work at the Chicago station. However, I will in a brief way give the general organization of the Bureau.

In 1891, because of increased duties, it was necessary to create subdivisions within the Bureau. The first reorganization was as follows:

The Inspection Division.

The Division of Pathology.

The Division of Field Inspections and Miscellaneous Work.

The Quarantine Division.

The names of the divisions indicate, in a general way, the duties assigned to each.

The Bureau has grown from the original force of 20, specified by the organic act, to a personnel numbering, at present, more than 4,000 and from the original office and experiment station, it has expanded until now the Bureau is composed of an experiment station, eleven major divisions, and six offices, as follows:

<i>Name of Division</i>	<i>When Established</i>	<i>Work Commenced</i>
Pathological Division	April 1, 1891	May 29, 1884
Dairy Division	July 1, 1895	July 1, 1895
Biochemic Division	July 1, 1896	Jan. 1, 1890
Zoological Division	July 1, 1906	Aug. 1, 1886
Animal Husbandry Division	Jan. 1, 1910	July 1, 1901
Field Inspection Division	Sept. 1, 1912	May 29, 1884
Meat Inspection Division	July 1, 1912	Aug. 30, 1890
Tick Eradication Division	May 1, 1917	May 29, 1884

¹Delivered at the fourth annual Veterinary Conference, University of Illinois, July 10-11-12 1923.

Tuberculosis Eradication Division	May 1, 1917	Jan. 1, 1907
Hog Cholera Division	Apr. 15, 1919	July 1, 1913
Virus Serum Control	July 1, 1920	Feb. 17, 1917
Quarantine Division	Apr. 1, 1891	May 29, 1884

The work has expanded until it covers 165 distinct projects.

Recently the Miscellaneous Division was merged with the Office of Personnel, and the Quarantine Division was merged with the Field Inspection Division.

In addition to the Divisions enumerated, the Bureau has Office of Accounts, Office of Personnel, Office of Chief Clerk, Office of Solicitor and the Editorial Office.

ACTIVITIES OF THE BUREAU

The activities of the Bureau have been directed along educational, research and regulatory lines and cover a wide range. You no doubt are familiar with what has been accomplished in the eradication of contagious pleuro-pneumonia, foot and mouth disease, dourine, sheep and cattle scabies, the discovery of the cause of Texas fever, and of hog cholera, and the means provided to combat these diseases, as well as the accomplishments of the Bureau's experiment station and laboratories in the investigation of tuberculosis, diseases of fowls, contagious abortion, dairy matters and the perfection of apparatus and methods.

One of the outstanding achievements has been the success in keeping foreign plagues out of our country. The Bureau of Animal Industry probably deserves more credit for preventing the introduction of destructive diseases into the United States than it does for its success in eradicating those with which it has had to contend. Since the Bureau was established, in 1884, none of the dreaded foreign plagues has gained access into the United States in the bodies of imported animals and none of these plagues has definitely established itself in this country.

As a further subdivision in the Bureau's organization, there are numerous offices or stations located throughout the United States. The work of the various stations is directed by an employee designated as Inspector-in-Charge. The inspector-in-charge of a station has direct supervision of all division projects which may come within the scope of his jurisdiction, which means that at the larger stations the inspector-in-charge may have more or less duties to perform under the direction of the chief of several of the major sub-divisions of the Bureau.

TWO OFFICES IN CHICAGO

In Chicago there are maintained two offices or stations, with inspectors-in-charge at each office. The tuberculosis eradication office or station is directed by Dr. J. J. Lintner, and he has charge of tuberculosis eradication work in the State of Illinois, reporting directly to the Washington office. I mention this in order to avoid confusion of the two offices. My own official designation is inspector-in-charge and I have supervision of the other work of the Bureau, in the Chicago area, which includes work under several of the Bureau projects to a greater or lesser degree.

Three laboratories are maintained by this Bureau at the Chicago station. A chemical laboratory is under the direction of Mr. C. T. N. Marsh, who reports directly to the Washington office and who works independently of any other office of the Bureau in Chicago. The functions of this laboratory are to examine samples of products prepared by establishments operating under federal meat inspection, as well as materials used by establishments in preparation of meat food products, in order to insure that no substances prohibited by the Bureau regulations are used. This laboratory also makes analyses of water samples, to insure that all water supplies are potable. The Chicago laboratory serves a district comprising several surrounding states.

PATHOLOGICAL LABORATORY

A pathological laboratory is maintained, with Dr. L. E. Day in charge. This laboratory also serves a territory comprising several surrounding states. Specimens of a pathological character are forwarded by various stations for examination and diagnosis. Certain investigations and work of a research nature in connection with abnormal conditions found on post-mortem inspection are carried on. Dr. Day is also authorized, by the Washington office, to perform travel over a large portion of the United States to investigate reported outbreaks of infectious diseases among live stock, and at times has been detailed by the Washington office to make investigations of infectious diseases of live stock in countries beyond the limits of this country.

A branch zoological laboratory is maintained in Chicago, which is nominally under the inspector-in-charge of the station. Dr. H. B. Raffensperger is director of the work conducted by this laboratory. The activities carried on by the zoological

laboratory are educational and experimental in character, and so far have been largely confined to internal parasites of live stock, particularly of swine. No doubt you are all familiar with the splendid work done through this laboratory and its field activities in connection with ascarids of swine.

As previously stated, the projects coming within the direct supervision of the inspector-in-charge of the Chicago station, other than the particular work previously cited, involves many of the projects of the Bureau. The importance of some, however, is much greater than others, because of the natural conditions controlling the work in this area. In the way of volume, meat inspection is the major project at the Chicago station.

There are approximately 70 establishments operating under the Federal Inspection Act in this area, and approximately 365 employes, of a total of 400 employed at this station, are engaged in meat inspection work. Meat inspection is strictly a regulatory work, and as conducted by the Bureau, has become the largest and most efficient service of its kind in the world.

SCOPE OF MEAT INSPECTION

Meat inspection includes ante-mortem and post-mortem inspection of all animals slaughtered at Federal-inspected establishments; supervision of the manufacture and preparation of all meat food products and their inspection after final process and at time of shipment; the labeling and marketing of products in their finished state; enforcement of all laws and regulations relative to sanitation, adulteration, false labeling, *et cetera*; enforcement of the Net Weight and Volume Law. Summarizing, it is the duty of the meat inspection force to see that no products from carcasses which are unwholesome because of disease, reach edible channels; to destroy and denature all carcasses and parts so diseased; to detect and condemn on re-inspection, and effectually destroy meat products which become unsound or unhealthful; to prevent the use of unhealthful ingredients in the preparation of meat products; to prevent adulteration of meat products; to prevent misleading or false labeling of meat products and insure that meats are not contaminated through insanitary handling or other insanitary exposures.

Field inspection or inspection for contagious or infectious diseases of live stock at the Chicago station, includes not only live stock passing through the Chicago yards, but also the

northern half of the State of Illinois, and in a limited way, Western Indiana, Southern Wisconsin and Eastern Iowa.

In connection with this work we have to tuberculin test cattle leaving the Chicago yards for breeding and dairy purposes; the immunization of swine going out for purposes other than immediate slaughter; the dipping of sheep; the cleansing and disinfecting of yards, pens, cars, *et cetera*, when such service is required; the inspection of animals imported into this country; the inspection of and certifying to animals intended for export; the enforcement of all quarantine laws and regulations, and laws and regulations covering the interstate movement of live stock.

In an experimental way, as yet, vaccination of feeder and stocker cattle for hemorrhagic septicemia has been instituted in the Chicago Stock Yards. At this time it cannot be stated as to what extent this work may develop, as it has not gone beyond the experimental state.

INSPECTION OF REACTORS

One of the important projects which has recently come into prominence, at the Chicago station, is the identification, post-mortem inspection and reporting to proper authorities of reactor cattle coming to market. This has grown to such proportions that now it is not considered unusual to receive from 800 to 1,000 head of such cattle weekly. To handle these animals properly is no small task, as each animal must be identified, inspected and reported individually and an error in one instance is likely to cause a very embarrassing item.

As public servants, the employees of the Bureau of Animal Industry cover a very large and varied field and I venture to state that but few have a fair knowledge of the extent of the service rendered by this Bureau. It is true that many have a very complete knowledge of certain limited or special service in which they are particularly interested or with which they may be closely in contact, but apparently there is a failure on the part of most people to familiarize themselves with the Bureau activities in the fullest sense, and I am very glad to have had this opportunity to give, in a brief way, some outline of the organization and work of the Bureau in general at the Chicago station.

No country has made more rapid progress than has the United States in the study of breeding, feeding and care of animals, and in the control and eradication of the diseases to which they are subject. And there is no country where live stock growers are

furnished with as much valuable information, in the form of books, bulletins and reports, as in the United States. All this is accomplished through the efforts of National and State officials, and State institutions working in cooperation. We may justly feel proud of our National and State institutions, and the work they are doing.

DROWNING THE SPOTTED PUP

Full many woes beset the soul through man's short mortal life,
But hurried pace to reach the goal beguiles the years of strife.
I am not fond of hate nor wrath, at knocks I do not fret;
If one would smooth the thorny path, 'tis better to forget.
The griefs and cares of other days I carefully conceal,
While in my heart there is a wound, a scar that will not heal.
There looms in memory the day I drank the bitter cup,
When father fixed that rope and stone to drown the spotted pup.

This victim of my father's choice had come a month before
To blend his lusty, whelpy voice to that of brothers four.
I plead with scientific lore to tell why fate allots
Just one color to puppies four and to the fifth all spots.
At any rate, I had to pick this spotted dog for mine,
Perhaps from pity, none the less, I loved his bark and whine.
But out of young life's dreggy bowl I drank a lasting sup,
When father walked down to the pond to drown my spotted pup.

Though time has somewhat dulled the pain, there lingers in my
mind
The pall of sorrow and the rain of tears that made me blind.
The intervening years have solved of problems not a few,
And in their course they have dissolved some of the doubts I knew.
Existence seems a mazy plan which we at times distrust,
And yet the destiny of man brings naught but what is just.
Still through it all I cannot help but bring the question up,
Why bear with some two-legged whelp and drown the spotted
pup?

—*T. P. White.*

THE RELATION OF THE CIVIL VETERINARY PROFESSION TO THE ARMY VETERINARY SERVICE¹

By LT. COL. N. S. MAYO, *Vet. O. R. C., Chicago, Ill.*

It will be admitted that the relation of the veterinarian to our National army service, is, or should be that of every sincere patriotic citizen, in fact as professionally trained men of more extensive education than the average citizen we have a greater responsibility than the average man. A good many veterinarians are graduates of schools established by the State for the training of its citizens, not for the selfish purpose of making more money for themselves, but that they shall be fitted to give a larger and better service to the state.

The states have established great institutions of learning such as this and maintain them generously with public funds for the purpose of training young men and women for leadership and public service. I do not know the amount the State invests in the education of each individual student here, but it is considerable, and such students are under a moral obligation to return to the people a greater service than one who has not had the advantages of a liberal education.

It has been proven by centuries of experience that society must be organized to protect the weak, curb the ambitious and to control human activities as justly as possible. In order to make social regulations effective, there must be force, either civil or military, or both.

Most of us civilian citizens are so engrossed with our professional or business affairs that we do not give the attention we should to national problems and particularly to our national security upon which our happiness, prosperity and national existence depends. If the question is raised, we say, "Let the army and navy take care of that; they have always done it well."

There are many of our citizens and some of our politicians who uniformly oppose all things military. The politician is usually animated by a desire for notoriety or political capital. Then there is the pacifist or conscientious objector, who views all things military as unholy, and with the pacifist is allied the radical, who aims to destroy our established government and emulate his "comrades" in soviet Russia. The pacifist we must

¹Delivered at the fourth annual Veterinary Conference, University of Illinois, July 10-11-12, 1923.

convince of his error, if we can, and if we cannot, we must be prepared with a sufficient force to save some of his just ideals, when threatened by some force more unholy than our army. The radical who would destroy our government, that has been evolved from centuries of human trials and experiences, we must control by force; all other methods have been proven useless.

It has been the traditional policy of the United States of America to maintain as small an army as is consistent with public safety. There are many citizens who think that, in the reaction following the great war, and considering the unsettled condition of the world, Congress has reduced our armed forces below the minimum of safety.

A large number of citizens believe that in our republic, where a very small standing army is maintained, a compulsory military training of at least six months should be established for all physically and mentally qualified young men. Such a training would make for better citizenship, a stronger and better government, a bulwark in time of peace and an economically trained and readily available force in time of national need. Our republic is not and never will be a militaristic nation and there is no danger that we will ever be dominated by a military hierarchy.

While Congress has not thought best to provide for compulsory military training, it has made limited provision for voluntary training and for a reserve corps. It is our duty as patriotic citizens to utilize the means provided by our government.

The first and highest duty as a citizen is to render to our country whatever service we can to protect our republic from danger, either from within or without. The Reserve Corps, planned by our military experts, offers a practical method of classifying our abilities, so that in a national emergency they can be utilized to advantage. All are familiar with the confusion and inefficiency of our army veterinary service when we entered the World War, due to lack of organization and military training of our profession. Past experience has painfully demonstrated that in a national emergency soldiers are readily obtained, but to secure trained officers to lead them has been a serious problem.

THE ARMY OF THE UNITED STATES

The National Defense Act, as amended June 4th, 1920, reads:

Be it enacted by the Senate and House of Representatives of The United States of America in Congress assembled, That the Army of the United States shall consist of the Regular Army, the National Guard while in the service of the United States, and the Organized Reserves, including the Officer's Reserve Corps and the Enlisted Reserve Corps.

Organization of the Army.—The organized peace establishment, including the Regular Army, the National Guard, and the Organized Reserves, shall include all of those divisions and other military organizations necessary to form the basis for a complete and immediate mobilization for the national defense in the event of a national emergency declared by Congress. The Army shall at all times be organized so far as practicable into brigades, divisions, and army corps, and, whenever the President may deem it expedient, into armies.

Officers' Reserve Corps.—For the purpose of providing a reserve of officers available for military service when needed, there shall be organized an Officers' Reserve Corps, consisting of general officers, of sections corresponding to the various branches of the Regular Army, and of such additional sections as the President may direct. The grades in each section and the number in each grade shall be as the President may prescribe. Reserve officers shall be appointed and commissioned by the President alone, except general officers, who shall be appointed by and with the advice and consent of the Senate. Appointment in every case shall be for a period of five years, but an appointment in force at the outbreak of war, or made in time of war, shall continue in force until six months after its termination. Any reserve officer may be discharged at any time in the discretion of the President. A reserve officer appointed during the existence of a state of war shall be entitled to discharge within six months after its termination if he makes application therefor. In time of peace, a reserve officer must, at the time of his appointment, be a citizen of the United States or of the Philippine Islands, between the ages of 21 and 60 years. Any person who has been an officer of the Army at any time between April 6, 1917, and June 30, 1919, or an officer of the Regular Army at any time, may be appointed as a reserve officer in the highest grade which he held in the Army or any lower grade; any person now serving as an officer of the National Guard may be appointed as a reserve officer in his present or any lower grade; no other person shall in time of peace be originally appointed as a reserve officer of Infantry, Cavalry, Field Artillery, Coast Artillery, or Air Service in a grade above that of second lieutenant. In time of peace appointments in the Infantry, Cavalry, Field Artillery, Coast Artillery, and Air Service shall be limited to former officers of the Army, graduates of the Reserve Officers' Training Corps, as provided in section 47b, hereof, warrant officers and enlisted men of the Regular Army, National Guard, and Enlisted Reserve Corps, and persons who served in the Army at some time between April 6, 1917, and November 11, 1918. Promotions and transfers shall be made under such rules as may be prescribed by the President, and shall be based so far as practicable upon recommendations made in the established chain of command, but no reserve officer shall be promoted to any grade in time of peace until he has held a commission for at least one year in the next lower grade. So far as practicable reserve officers shall be assigned to units in the locality of their places of residence. Nothing in this act shall operate to deprive a reserve officer of the reserve commission he now holds. Any reserve officer may hold a commission in the National Guard without thereby vacating his reserve commission.

According to the plans of the General Staff 200,000 reserve officers are needed. At present there are only 72,000 reserve officers in all branches of the service.

In order to join the Veterinary O. R. C. a veterinarian must be a citizen of the United States, a graduate of a recognized veterinary college, between the ages of 21 and 60 years.

Requirements to Join.—Veterinarians of the World War can join on their war record, up to Nov. 11, 1923. Application must be made upon prescribed forms and the veterinarian must take a physical and mental examination. The grade given will depend upon the qualifications and experience of the veterinarian, but

no officer who has served in the World War can be appointed to a higher grade than he held in the War. An officer must serve three years in the grade to which he is appointed before being eligible for promotion. Appointments are made for five years. In time of war officers of the reserve corps are assured of priority service in time of war.

Assignment.—Veterinary officers will be assigned to units of the organized reserve or for special service. So far as possible officers are assigned to units nearest to their home. All reserve officers are, in time of peace, under the administrative control of the Corps Area Commander.

Training.—Opportunity for training is given by 15 days active duty each year with pay, and also by correspondence courses. If an officer is called for fifteen days' active training he may be exempt if special circumstances warrant.

Active Duty.—A reserve officer will be called to active duty in a national emergency so declared by Congress and he may be called for 15 days' training as indicated. When on this Service he receives the pay and allowances of his rank.

Separation.—In time of peace resignations of reserve officers will be accepted for good cause or they may be discharged for cause. Reserve officers are not entitled to retirement.

To those of us whose military training and experience has been limited, the Reserve Corps offers a splendid opportunity to obtain theoretical training that should be helpful in a national emergency. We believe as do a majority of our citizens, that Congress should make ample provision for the practical training of the Reserve Corps in the various military centers under the immediate supervision of military officers of thorough training and experience. With a suitable Reserve Corps properly trained, an efficient agent for preparedness is established.

Through the Reserve Corps, we can get reliable information from experts as to the actual military needs of our country. We can help in developing a public sentiment favoring a military force to meet our national needs, and we can go to our representatives as citizens, who know our country's military needs and help in securing proper and just legislation. We, as members of the Reserve Corps, are better fitted to overcome ignorance and prejudice regarding our army among our fellow citizens.

The Reserve Corps offers a real opportunity to assist in developing and upholding high ideals, not only as to citizenship, but as to our national policy. We are proud of the standard already

established. Our unselfish policy in the World War, in Cuba and the Philippines, as carried out by our army and navy, has been the pride of every patriotic citizen, and in developing these ideals we shall be better citizens. We do not want an armed force for conquest, but for public safety; to uphold our national ideals; and as a means to aid and help those people less fortunate.

We do not want war, but if war comes, as it will, the Reserve Corps is a valuable agent of preparedness. War is only one phase of the eternal struggle for existence. That this struggle will continue as long as life exists is as certain as the law of gravity. The only way to reduce suffering and human agony is to be prepared. To those false prophets, who cry "Down with force," we can only refer to our Savior who "came to bring peace on earth and good will to men," yet the great Prince of Peace was compelled to use force to drive the wicked money-changers from the temple.

HUMANE SLAUGHTERING

The new law of Holland relative to the slaughtering of animals compels humane stunning, not only in private, but in all public abattoirs. By the new law it is forbidden to attempt to stun by "a blow upon the head, or behind the ears," to begin dressing before the "body is completely inert," to "hang up before stunning." The stunning must always be "by means of devices with which in some mechanical way the brain is destroyed." Exception is made where Hebrews slaughter.

—*Our Dumb Animals.*

O WONDERFUL HORSE!

"O Horse, you are a wonderful thing; no buttons to push, no horn to honk; you start yourself, no clutch to slip; no spark to miss, no gears to strip; no license-buying every year, with plates to screw on front and rear; no gas bills climbing up each day, stealing the joy of life away; no speed cops chugging in your rear, yelling summons in your ear. Your inner tubes are all O. K., and, thank the Lord, they stay that way; your spark plugs never miss and fuss; your motor never makes us cuss. Your frame is good for many a mile; your body never changes style. Your wants are few and easy met; you've something on the auto yet."—*Ranger H. R. Elliott, of the Malheur, in American Forestry (Washington).*

LIMBERNECK IN CHICKENS

By L. P. DOYLE

Purdue University Agricultural Experiment Station, Lafayette, Ind.

There is a form of trouble prevalent during the late spring, summer, and fall that is responsible for heavy losses among chickens. It seems probable that, in some years, in Indiana, this trouble is second to none as a cause of loss among chickens during the warmer portion of the year. It occurs occasionally in other birds, but is especially important among chickens.

SYMPTOMS

The symptoms shown by affected birds conform to those usually considered as "limberneck." In rapidly fatal cases extreme prostration may be the only symptom shown. Usually,



A cockerel poisoned by eating maggots from a hog's carcass. It shows the partially open eye so often seen in affected birds in natural outbreaks of limberneck.

however, an affected bird shows a group of symptoms that are quite characteristic. The bird is found sitting or lying on its sternum and abdomen, with its head on the ground and its eyes closed. There is considerable mucus on the beak and in the mouth, so that soil, leaves or chaff may cling to the beak in such a way as to be conspicuous. The comb and wattles are red, and the body temperature is normal or subnormal. There is usually a watery discharge from the vent, but the urine is normal in color. When an attempt is made to rouse the bird it may not be able to raise its head, or it may raise it unsteadily and partly

open its eyes—the eyes usually never becoming more than half open. The partially opened eye is a striking symptom in this affection. When made to move, the bird takes a few steps in a crouching position (or it may assume a “duck-like” posture) and then goes down again on its sternum and abdomen. The difficulty with which the bird moves suggests that there is a marked hypotonicity of the muscles concerned in walking. In some cases the affected bird’s feathers are very easily pulled from the body.

An appreciable proportion of affected birds recover without treatment. The manner of recovery is quite characteristic. Recovery is either fairly rapid and complete or it is marked by a peculiar aftermath that may continue for two or three days. During this aftermath the bird makes futile attempts to eat, in which it picks at the food but the beak fails to reach the food by one to three inches.

POST MORTEM FINDINGS

Post-mortem examination of birds dead of limberneck usually does not show any recognizable gross lesions. In some cases there is a well marked congestion of the duodenum. Frequently maggots or fly larvae are found in the crop. However, as will be seen from experiments discussed later, the mere finding of fly larvae in the crop of a dead bird does not establish a diagnosis of the intoxication commonly known as limberneck.

In September, 1920, Wilkins and Dutcher¹ reported that they produced limberneck in chickens by feeding them larvae of *Lucilia caesar* that developed from eggs laid on the carcass of a chicken that died of limberneck. They also found that paralysis and death could be produced in guinea pigs by feeding them as few as one or two larvae.

Saunders² and his coworkers had previously reported that the larvae of *Lucilia caesar* were extremely toxic when fed to guinea pigs.

In January, 1922, Bengtson³ reported the isolation of a toxin-producing anaerobe from the larvae of *Lucilia caesar*. She found that this organism was culturally distinct from the strains of *Bacillus botulinus* isolated in this country. She also found that so-called polyvalent botulinus antitoxin (types A and B) did not protect against the toxin produced by the organism isolated from the larvae.

¹Jour. A. V. M. A., 1920, Vol. 57, p. 653.

²Jour. Mo. State Med. Assoc., 1913-14, Vol. 10, p. 305.

³Public Health Report, 37, 164, Jan. 27, 1922.

By feeding chickens carrion and maggots from carrion, the present writer has produced symptoms in chickens indistinguishable from those occurring in natural outbreaks of limberneck. The findings of others regarding the toxicity of such maggots for guinea pigs were also confirmed. From some of the published articles on poisoning from maggots, one is apt to get the impression that the fly larvae, especially that of *Lucilia caesar*, plays an essential role in producing the disease.

MAGGOTS NOT ESSENTIAL

That the maggot does not play an essential part in the production of the toxin is shown by the following experiment:

During the early part of September, 1921, a fat hen was killed; some muscle was taken from her breast, divided into two portions and placed in separate bell-jars. Several green "blow-flies" were placed under one of the bell-jars while the other one was kept free from flies. At the end of four days there were maggots in and on the muscle, where the flies had been placed, but none in or on the muscle that was kept free from flies.

A 500-gram guinea pig that was fed 16 of the 4-day-old maggots died in 3 days. A 350-gram guinea pig that was fed 2 grams of the muscle kept free from flies died within 18 hours.

EFFECT OF BOILING POISONOUS MEAT AND MAGGOTS

A 350-gram guinea pig was fed one-fourth gram of the chicken breast-muscle kept free from flies. The guinea pig died within 18 hours.

A 495-gram guinea pig was fed 2 grams of small bits of the chicken muscle that had been dropped into boiling water, allowed to remain 2 minutes and was then quickly cooled. This guinea pig remained well for at least 2 weeks.

A 450-gram guinea pig, that was fed 16 maggots from a hog's carcass, died within 36 hours. At the same time a 420-gram guinea pig was fed 18 of the maggots that had been in boiling water for 3 minutes. The latter guinea pig remained well for at least 10 days.

EFFECT OF BOTULINUS ANTITOXIN

Since symptoms indistinguishable from those occurring in natural outbreaks of limberneck, were produced in chickens by feeding them carrion and maggots from carrion; and, since many of the natural outbreaks of limberneck can be traced to such a cause, it was decided to test the protective action of "polyvalent" botulinus antitoxin against the toxic substance in carrion and

maggots from carrion. The results of such a test on guinea pigs are shown in Table I.

TABLE I
TEST OF THE PROTECTIVE ACTION OF BOTULINUS ANTITOXIN AGAINST THE
TOXIN IN CARRION AND MAGGOTS

Wt. of Guinea Pig	Treatment	Results
450 grams	6 cc antitoxin,* intraperitoneally; 14 maggots from hog's carcass were fed 5 hours later.	Died, 3 days
200 grams	7 maggots	Slight symptoms recovered
350 grams	$\frac{1}{4}$ gram of chicken breast-muscle kept free from flies	Dead, 18 hours
410 grams	8 cc antitoxin, subcutaneously; 2 hours later, $\frac{1}{2}$ gram of above muscle.	Dead, 18 hours
650 grams	8 cc antitoxin, intraperitoneally	Remained well

*The antitoxin was polyvalent (types A and B); kindly furnished by Dr. Robert Graham, of the Illinois Agricultural Experiment Station.

Thus, it appears that the antitoxin did not protect guinea pigs against the toxin in the meat or maggots.

MAGGOTS AND CARRION SOMETIMES HARMLESS

That carrion and the maggots from carrion are sometimes not poisonous is borne out by the experience of poultrymen and by the following experiments:

Three grams of putrid sheep's lung were fed to a 280-gram guinea pig without any ill effect.

A 440-gram guinea pig was fed 10 six-day-old maggots from the sheep's lung, with negative results.

A 475-gram guinea pig was fed 20 maggots from the head of a chicken that died of cholera, with negative results.

MANURE AND MAGGOTS FROM MANURE

On a farm where limberneck was occurring in chickens it was noted that the chickens were eating a great deal of cow manure and maggots from the cow manure. Consequently some of the manure and maggots were fed as follows:

A 595-gram guinea pig was fed 7.5 grams of the cow manure. A 570-gram guinea pig was fed 70 maggots from the cow manure. A 380-gram guinea pig was fed 80 pupae from the cow manure. All three guinea pigs remained well for at least two weeks.

CONCLUSIONS

It seems likely that the common source of the toxic substance responsible for limberneck is carrion, or maggots from carrion. However, the maggots evidently play only a passive part in carrying the poison produced in carrion.

Limberneck is an important cause of loss among chickens during the warmer portion of the year.

Neither the fly nor the maggot is essential for the development of a toxin capable of causing limberneck.

The toxic substance in carrion and maggots is quickly destroyed by boiling.

Polyvalent (types A and B) botulinus antitoxin did not protect against the toxin in carrion and maggots.

Carrion and maggots from carrion are sometimes non-toxic for guinea pigs.

DEAN KLEIN HONORED

Dr. Louis A. Klein, Dean of the School of Veterinary Medicine, University of Pennsylvania, attended the joint annual meeting of the American Association of Medical Milk Commissions and the Certified Milk Producers' Association, in San Francisco, in June.

On the evening of June 24, a dinner was given in Dean Klein's honor, by Pennsylvania alumni in and near San Francisco. Those present were: Drs. Joseph P. Bushong, '06; John C. Corl, '19; George H. Hart, '03; John G. Jackley, '10; William Veit, '06; and Harry H. Howe, '09.

THE TEAMING HORSE

Eight years ago a friend said to us, "In five years you won't see a horse on the streets of our cities." The man who said it was careful in his statements and believed what he said. We have just read the remark of a large cartage operator in Philadelphia, Mr. James Gallagher. He says, "I would be \$50,000 better off if I had never seen a motor truck, and if I were offered, gratis, a fleet of motor trucks and compelled to use them for five years, I should go broke." It looks as if the humane societies of the country would have to be looking after the interests of the horse for many years to come.

—*Our Dumb Animals.*

THE MACROSCOPIC AGGLUTINATION TEST AS INFLUENCED BY THE FATTY CONTENT OF THE BLOOD SERUM OF FOWLS

I. Effect of Starvation Upon Fatlike Content

By E. R. HITCHNER

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During the past fall and winter the blood of over 4000 fowls has been tested for bacillary white diarrhea by means of the macroscopic agglutination test. In many cases the fat content of the blood serum was so heavy that the accuracy of the test was greatly impaired. Since most of the samples were drawn at a period when the hens were laying heavily, and the ration fed was high in protein and fat, it was natural to suppose that these factors were the cause of the high proportion of fat in the blood. Since the efficiency in the control of white diarrhea depends upon the accuracy of the test, the following experiments were conducted in an effort to decrease the fatty content of the serum at the time of examination.

In a review of the literature relative to the effect of starvation upon the fat in the blood, it was found that the experimental results were not in complete agreement.

Bloor¹ in a series of experiments conducted with dogs finds an increase in the fat in blood during a period of starvation up to five days, followed by a decrease. By stuffing a dog, which had previously shown no increase in fat following a period of starvation, with fats and proteins, and then starving for five days, an increase during the period of starvation was noted. He concludes that this increase may be due to the nutritional condition of the animal and depends on one hand on the readiness with which the fat in the fat-stores was available, and on the other hand upon the rapidity with which the fat was burned. The author does not state whether the increase was noted in the serum, as the data are apparently based upon the analysis of the whole blood.

In experiments conducted with laying and non-laying hens, Warner and Edmond² find the fat content to be higher in the laying than in the non-laying fowls, although both were fed the same ration. They state that this may be due to the fact that

¹Bloor, W. R., 1914, Fat Content in Normal Blood, *J. Biol. Chem.* 19, pp. 2.

²Warner, D. E. & Edmond, H. D. 1917, Blood Fat in Domestic Fowls in Relation to Egg Production, *J. Biol. Chem.* 31, 281.

the fat stored in the body is taken by the blood and carried to the egg-yolk. They likewise find a correlation between the color of the legs, beak and vent, and the fat content of blood. Laying hens with pale legs should have a higher content than non-laying hens with yellow legs, indicating that non-layers may be storing fat in the body tissue. These investigators furthermore state that fasting hens for sixteen hours brings about no decrease in the fat content of the blood.

In conducting the agglutination test only the serum is used, hence any practice that would tend to decrease the fat content in the serum, regardless of the effect upon the whole blood, is of vital importance. Knudson⁴ notes a marked increase in the turbidity of blood plasma following the ingestion of fat. Bloor² states that the blood serum, eleven to twelve hours after a meal, is clear and free from suspended particles and remains so during a period of fasting, although considerable quantities of fat must be passing from the fat-stores into the blood for use, especially after the second or third day. He states that it is probable that the fat is not being carried as such in the blood, but as some derivative more readily miscible with water, as lecithin.

The main difficulty encountered in conducting the tests throughout the winter months was the tendency of the fat, either to rise in the tube after mixing the serum and antigen, forming a scum on the top, or else to adhere to the sides as a flaky precipitate. When such conditions existed it was impossible to differentiate between positive and negative reactions.

In some preliminary observations upon the blood of hens that had been accidentally subjected to a period of starvation, it was found that the blood serum was free from fat and no difficulty was experienced in reading the reactions, whereas the test with other hens of the same flock fed before bleeding showed considerable turbidity.

In order to gain further information upon this observation, the following experiments were conducted. A flock of Rhode Island Red hens in good lay was divided into three lots of ten hens each. All groups were fed in the evening. Lot A, check, was fed the following morning and bled the same afternoon. Lot B received no feed the following day and was bled after fasting for 24 hours. Lot C was starved for 48 hours and then bled.

The serums were allowed to rise and the agglutination test

²Bloor, W. R., 1916, Fat Assimilation, *J. Biol. Chem.* 24 pp. 448.

⁴Knudson, A. 1917, Cholesterol Esters During Fat Absorption, *J. Biol. Chem.* 32, 337.

conducted according to the procedure recommended by Rettger⁵. After incubating for two days at 37° C, the tubes were read and the effect of starvation upon the test, as shown by the turbidity, was noted. The results are given in Table I.

TABLE I
STARVATION AND ITS EFFECT ON FAT CONTENT OF BLOOD SERA

Bird	LOT A Check	LOT B Starved 24 hours	LOT C Starved 48 hours
	Agglutination Solution	Agglutination Solution	Agglutination Solution
1	Fat heavy	Clear	Clear
2	Fat slight	Slight	Clear
3	Fat medium	Clear	Clear
4	Fat slight	Very slight	Clear
5	Fat medium	Clear	Clear
6	Fat flaky	Slight layer	Slight tube 1
7	Fat heavy	Clear	Clear
8	Fat heavy	Medium	Clear
9	Fat slight	Slight	Clear
10	Fat very turbid	Clear	Clear

From the data in Table I, it is apparent that starvation previous to bleeding markedly decreases the fat content of the sera.

It will be noted that the serum from every bird in Lot A contained sufficient fat to cause marked cloudiness in the resulting agglutination test-solution. In most cases, this turbidity was so great as to obscure the results. Starving for 24 hours caused a marked decrease in the fat in 50% of the birds, whereas starving for 48 hours produced sera that gave excellent results in every case. It is apparent, therefore, that fasting may cause a marked decrease in the fat content of the blood sera of fowls and that the accuracy of the agglutination test may be greatly improved.

In order to determine whether a shorter starvation period would produce similar results, three lots of Leghorn pullets were treated in the following manner: Lot A, check; Lot B, starved 24 hours; Lot C, starved 36 hours. The fowls were bled and the test conducted as in Experiment I. The results are given in Table II.

It will be noted from Table II, that starvation for 36 hours does not cause so marked a decrease as the 48-hour period. It may be that the difference in breed would account for these results. However, in the sera from Lot C the test-solution from

⁵Rettger, L. F. 1919, Method of Drawing Blood Samples and of Making Agglutination Test for Ovarian Infection in Breeding Stock. Bul. of Immed. Infor. No. 1, Storrs Ag. Exp. Sta.

TABLE II
FAT CONTENT OF BLOOD SERUM AS AFFECTED BY VARYING PERIODS
OF STARVATION

Bird	LOT A	LOT B	LOT C
	Check Test Solution	Starved 24 hours Test Solution	Starved 36 hours Test Solution
1	Flaky	Turbidity medium	Clear
2	Turbidity medium	Tubridity heavy	Turbidity slight
3	Turbidity heavy	Turbidity slight	Clear
4	Turbidity slight	Clear	Clear
5	Turbidity heavy	Clear	Clear
6	Clear	Turbidity Tube 1	Clear
7	Turbidity flaky	Clear	Turbidity medium
8	Turbidity medium	Clear	Turbidity tube 1
9	Clear	Clear	Turbidity very slight
10	Turbidity very slight	Turbidity heavy	Clear

only one bird (7) was so turbid as to cause any question in reading the test.

Although the results of the two experiments indicate that greater accuracy in the agglutination test would result from starving all birds in heavy lay, previous to bleeding, yet it is realized that such operations might cause a decrease in egg production. Since this is a vital question with the producer and would doubtless create considerable antagonism on his part, an experiment was conducted to throw some light on this.

Two lots of pullets of mixed breeds were placed in separate pens and fed alike for a period of one week. During this period the average daily egg production was recorded. Lot A, check (20 pullets), was bled on the eighth day without any period of starvation. Lot B (18 pullets) was starved for a period of 36 hours previous to bleeding. The average daily egg production was determined for a period of two weeks following the bleeding operation. These results are given in Table III.

TABLE III
EFFECT OF STARVATION ON EGG PRODUCTION DAILY AVERAGE

	One Week Before Bleeding	1st Week After Bleeding	2nd Week After Bleeding
Lot A	8	10	8.5
Lot B	8	4.2	6.6

It will be noted that starvation caused a marked falling off in egg production during the first week. For four days following the starvation period the daily production dropped to three. This was followed by a slow recovery until at the end of the

second week, the daily production had reached normal. Bleeding alone had no noticeable effect on the egg production.

The sera from the hens in Lots A and B were tested according to the usual procedures. Of the twenty birds tested in Lot A, only three gave clear sera, while in eleven cases the agglutination solution was turbid to such an extent as to invalidate the test. In Lot B, clear sera were experienced in eleven cases while in the remaining seven only one showed a heavy fat content. It is evident that starving laying hens previous to bleeding results in a marked decrease in egg production with a slow recovery, although the accuracy of the agglutination test, as evidenced by the clarity of the serum, is greatly improved. Although it may be suggested that birds in heavy lay be fasted for at least 24 hours previous to drawing the blood samples for the agglutination test for bacillary white diarrhea, the individual producer must decide which is of the greater importance, accuracy in the test and possible decreased egg production or uncertain test results with normal production.

Further work is to be conducted in an effort to decrease the fat content without any marked effect on egg production. Various diets of low protein and fat content will be tried during a period previous to sampling.

SUMMARY

1. The blood sera of hens in heavy lay gives very unsatisfactory results in the macroscopic agglutination test for bacillary white diarrhea.
2. The high fat content of the sera interferes with the accurate interpretation of the results.
3. Starving fowls for at least 36 hours previous to bleeding results in clear sera and excellent tests.
4. Starvation causes a marked decrease in egg production with a slow recovery after four days.

The whaling industry is very promising this season. Whales are reported early and plentiful on the grounds, the whale oil market is on the climb, and the demand for canned whale meat has become so pronounced that the prospective pack of the British Columbia whalers is already disposed of. The canned whale meat is mostly distributed from England.—*Dearborn Independent*.

IMMUNIZATION AGAINST HEMORRHAGIC SEPTICEMIA

By J. R. MOHLER, *Washington, D. C.*

Chief, Bureau of Animal Industry -

A representative of the Bureau who attended the recent meeting of the Missouri Valley Veterinary Association, at Omaha, stated on his return to Washington that one of the veterinarians present seemed to have misinterpreted the proposed action of the Bureau in immunizing against hemorrhagic septicemia stocker and feeder cattle which are to be removed from public stock yards to farms and feed lots.

Reports have been received showing increasing losses during the past several years from this disease. Although it occasionally manifests itself in cattle that have not been moved from their home farms or range pastures, it is most prevalent in animals that have been shipped long distances, especially those that were unloaded at public stock yards or at rest stations for feed and water.

So much complaint has been received from purchasers of feeders and stockers in practically all sections of the corn belt that the matter was brought to the attention of the Secretary of Agriculture and the Bureau. On May 18 a committee representing the Traders' Live Stock Exchange, of Chicago, and the Chicago Live Stock Exchange, came to Washington and urged upon the Department the importance to the livestock interests of the country of putting into effect additional control measures to prevent as far as possible the heavy losses.

On June 21 the Chief of the Bureau of Animal Industry and the Chief of the Field Inspection Division met in Chicago representatives of the various interests involved to consider further the situation and plans of procedure.

After careful consideration of every phase of the subject, it was the consensus of opinion that in addition to continuing the control measures now in effect, which prohibit the shipment of visibly sick animals and require the cleaning and disinfection of yards and cars known to be infected, all stock yards regularly used in feeding, watering and resting live stock en route to or from public markets, all divisions in such markets set aside for the handling of feeder and stocker cattle should be cleaned and

disinfected at stated intervals; that arrangements should be made by the Department with the railroads to supervise the disinfection of cars, which will be furnished to the shippers upon request, and that the Department should produce and furnish and administer the material for all shippers who desire to have their animals immunized before they are removed from public stock yards. Immunization is optional with the shipper, and it was estimated that the Department might be able to furnish the material and administer it at a nominal price of ten cents per head.

When this procedure was urged by the live stock interests, it was made clear that although the Department would be glad to give all assistance possible there were no funds available either to produce the material or to administer it. In view of the present importance of this matter, the Live Stock Exchanges of the large cattle markets offered to advance funds, which is permissible under a law passed several years ago authorizing the Secretary of Agriculture to accept money from outside sources for such purposes when in his judgment it would be to the public interest.

At the time the matter was discussed with the representatives of the Live Stock Exchanges and others interested it was explained that the immunization of cattle against hemorrhagic septicemia is yet in the experimental stage, but the results thus far obtained in reducing losses are encouraging.

The offer of the Live Stock Exchanges to advance funds to begin the work was accepted, as there are good prospects of rendering a service to the purchasers of stockers and feeders in reducing their losses, and it seemed to present an opportunity to try the different varieties of protective treatment for a limited time and extensive experiments over a wide range of country. It is important to all concerned to ascertain the value of immunization against hemorrhagic septicemia and what treatment is most effectual. Since the Bureau does not have it in mind to continue the work as a permanent project, it would be of much interest to the practitioner if some procedure is established through the experiments which will prove effectual, or, on the other hand, to learn that the immunization is not satisfactory.

While the Bureau is interested, it does not have the authority to specify what Live Stock Exchanges shall charge for immunizing cattle that pass through the different stock yards, but it is presumed the cost will be reasonable.

From the interest manifested by the various Live Stock Ex-

changes in the beginning it was thought that the plan would be put in operation at all the leading live stock markets. At present the Bureau is asked to extend its cooperation only to the markets located at Chicago, Illinois; Wichita, Kansas; and Indianapolis, Indiana. It has been learned recently that the Sioux City (Iowa) Live Stock Exchange has turned over the work at that market to a Sioux City serum company. Thus it seems that the experiments cannot be conducted on as extensive a scale during the present season as seemed to be possible at the beginning. But it is hoped that sufficient experimental field work may be done between now and spring to give us additional information in regard to the value of the immunization treatment and the variety of treatment that gives the most satisfactory results.

If the reports obtained from the owners of vaccinated cattle give the satisfaction expected, Congress will be asked at the coming session this winter to make an appropriation to cover the supervision of this work. When such funds become available, the vaccination for hemorrhagic septicemia at the stock yards will be placed on the same footing as hog cholera vaccination at these yards, where approved commercial vaccines will be used by veterinarians acceptable to the stock yards companies and the Bureau, but under the supervision of a federal veterinarian.

Raising queen bees brings a Calallen, Texas, man an annual revenue of more than \$50,000, most of which is clear profit. Breeding queen bees is done partly by artificial means. He figures on obtaining about 100 queens from every hive of 2,000 to 3,000 working bees, instead of only one queen. Queen bees bring from \$1 to \$2.75 each.—*Dearborn Independent*.

A rogues' gallery of insects is being organized by the American Nature Association in Washington. The pests are to be identified and information as to their migrations gathered together with the best methods of opposing them. Such insects as the Hessian fly and the boll weevil will no doubt head the list of undesirables.—*Dearborn Independent*.

The ancient game of polo had an illustrious history in the East before the British Army carried it home from India and made it fashionable in the British Isles and America. About A. D., 600, polo, which had traveled from Persia to Turkestan and Tibet, became popular with the Chinese where the women played as well as the men.—*Dearborn Independent*.

CLINICAL AND CASE REPORTS

(Practitioners and others are invited to contribute to this department reports of unusual and interesting cases which may be helpful to others in the profession.)

FRACTURE OF FEMUR IN AN ELEPHANT¹

By W. REID BLAIR, New York, N. Y.

At the last meeting of our Association the chairman of the Program Committee announced that some of those present would receive a telephone message to present a case report at this meeting. During my absence from home such a message was received there, requesting me to present a case report on a wild animal, and not being able to present an alibi, I beg to offer the following:

Early one November morning, two years ago, our female African elephant "Sultana" was reported to be very lame in the left hind leg. Upon examination she was found painfully lame, and exhibiting an enormous swelling around and below the stifle joint. At the time, a fracture or dislocation of the patella was suspected, but owing to the enormous swelling about the joint, manipulation of the part was difficult, and I was unable to detect any evidence of crepitation which would indicate fracture.

The temperature of 100° F. for the first two days indicated a slight fever, but not enough to suggest lymphangitis. Six ounces of potassium nitrate was given in a pail of water twice daily.

While the swelling increased and involved the entire limb below the stifle joint, the lameness seemed to improve somewhat under the daily treatment of alternating hot and cold water irrigation, by means of a hose, followed by the application of stimulating liniments. Beyond the inability to use the leg or place any weight upon it, the elephant gave no decided evidence of discomfort; the temperature after two days was normal (98° F.) and the appetite improved.

Owing to the fact that the elephant could not use the leg she was reluctant to make any attempt to lie down at night, and as a result of the constant standing on the other hind leg, and trying to save the injured one in moving about the stall, she dragged the well foot and wore away the pad and front nails so much that a form of pressure necrosis developed. This latter condition

¹Read before the Veterinary Medical Association of New York City, June 6, 1923.

was treated with difficulty. Finally, after several weeks, she did lie down, and after letting her rest in this position for several days she was raised and supported in a sling, but she soon became unable to support herself in the sling and was finally humanely destroyed by shooting.

After the leg had been carefully dissected, it was found that the injury consisted of a fracture of the internal condyle of the femur, with displacement of the condyle. The displacement of the broken bone had prevented any repair of a bony nature taking place, although the attempted repair of the injury in the form of new-formed fibrous tissue was enormous. The capsular ligament was obliterated and replaced by a large, fibroid, capsular sac containing fibrin and inflammatory exudates.

Just how the elephant sustained a fall sufficient to cause such a violent fracture of the femur is shrouded in mystery; but I suspect it may have been caused by the animal slipping off the side of the concrete runway, leading from the outside yard to her stall, inside the building.

If she had accidentally stepped off the runway half-way up, she would have dropped on that leg about 18 inches, and by throwing her ponderous weight on that leg it is quite reasonable to suppose such an injury could have occurred.

PSEUDOLEUKEMIA IN A COW

By R. W. MERRIMAN, Ames, Iowa

Senior Veterinary Student, Iowa State College

Report on Case No. 642, a grade female bovine, 12 years old and weighing 1100 pounds. Entered clinic April 30, 1923.

History: The cow calved some time ago. She was six months pregnant at the time she entered the hospital. Dr. Walsh, college clinician, was called to attend the case about three weeks preceding her entrance. At that time the animal showed a marked shoulder lameness in the left front limb. The owner said the animal had been lame intermittently for some time but that previously lameness occurred in a hind limb. She went severely lame a day or so before the first visit. She was tested for tuberculosis six years ago and passed at that time. On April 30th the cow was brought to the hospital.

Symptoms: Pulse 84, respirations 90 and labored, temperature 102.2° F. Bloating was evident. General condition was fair. Swinging- and supporting-leg lameness of the left front

limb. Upon moving the animal forward, the limb was markedly abducted and the toe of the affected limb was dragged when the animal moved forward.

The mandibular, prescapular, axillary and supra-mammary lymph glands were enlarged and rather tense, but their normal outline was preserved. There was extensive edema over the entire region of the brisket. Mucous membranes were anemic. The animal soon became listless and refused feed. On May 2nd the intradermal tuberculin test was applied. The readings were made at the 48th, 72nd and 96th hours following the injection and found negative. The cow underwent rapid emaciation and on May 3rd she was unable to walk. Soon she developed a profuse fetid diarrhea. The temperature rose to 105.4°, pulse 110 and respirations 66, very labored.

On May 4th a portion of the left axillary lymph gland was resected and a detailed microscopic examination was made of it. Nothing of diagnostic value could be found. Examination of the blood showed:

Hemoglobin—75%

Red blood corpuscles—2,800,000

White blood corpuscles—6,000

Examination of the lungs revealed increased vesicular breathing only. On May 5th the cow aborted an immature calf. May 7th an autopsy was held with the following findings:

1. Marked edematous infiltration of subcutaneous tissues of the pectoral region.
2. The prepectoral, bronchial and mediastinal, sublumbar, supramammary and inguinal lymph nodes and vessels were markedly enlarged. The nodes were from 50 to 60 times their normal size, but their normal shape and internal structure were retained (medulla and cortex normal).
3. The spleen was enormous in size—weight 9½ pounds.
4. Metritis was present.
5. Very slight gastritis and enteritis.

In conclusion, the lesions were confined to the lymphatic system. The red cells were greatly decreased with a normal number of white cells. Post-mortem diagnosis was pseudoleukemia.

A camel in the midst of green grass languishes and grows thin, but surrounded by sagebrush and thorny desert vegetation he is thoroughly happy and contented.—*Dearborn Independent*.

REVIEWS

HISTORY OF THE EDINBURGH VETERINARY COLLEGE. O. Charnock Bradley, M. D., D. Sc., M. R. C. V. S., Principal of the Royal (Dick) Veterinary College, Edinburgh. 101 pages, with 17 full-page, half-tone illustrations. Published by Oliver and Boyd, Edinburgh, 1923. Half linen, 5 s; full parchment, 7 s. 6 d; (postage, 6 d. extra).

In connection with the celebration of the Centenary of the Royal (Dick) Veterinary College, of Edinburgh, Dr. O. Charnock Bradley, who has been Principal of this famous institution since 1911, has seen fit to record the history of the college, from 1823 to 1923.

As might be imagined, a great deal of the early chapters is devoted to the famous founder of the Edinburgh College, William Dick. For over a score of years this pioneer in veterinary education was the sole teacher in his school, as he did not start the formation of a staff until 1844. It is said of him that he was in advance of his time, in a great many respects, and this appears the more true as we read this history and become better acquainted with his aims and aspirations.

This work is a labor of love, as the proceeds of the sale of the book go toward the Fellowship Fund in connection with the Centenary Celebration.

COLLECTED PAPERS FROM THE MEDICAL RESEARCH LABORATORIES OF PARKE, DAVIS AND COMPANY. Dr. E. M. Houghton, Director. Volume 8. By various authors. 621 pages, with numerous illustrations in the text. Leather. Published by Parke, Davis & Co., Detroit, 1923.

This book contains reprints of seventy-three scientific papers written by members of the medical research staff, and published in various journals during the years 1919 and 1920. These papers cover such subjects as pharmacology, chemistry, bacteriology, botany, nutrition, endocrinology, parasitology, vitamins and animal pathology. Under the latter subject are noted papers on the subjects of infectious abortion, anthrax, hemorrhagic septicemia, blackleg, snuffles and anaphylaxis. Of particular interest to veterinarians are the Studies on Anthelmintics, in ten papers, by Maurice C. Hall.

ABSTRACTS

INFECTIOUS ABORTION IN DOMESTIC ANIMALS I. INFECTION OF SWINE AND RABBITS. H. M. Weeter. Jour. Inf. Dis., xxxii (1923), 6, p. 401.

Although it has been known for twenty-five years that *Bacterium abortum* was the cause of much of the abortion in cattle, the first recorded isolation of this organism from an aborted swine fetus was made in 1914 by Traum. Later, Good and Smith, of Kentucky, isolated *Bact. abortum* during an outbreak of abortion in a herd of swine. With this culture they were able to produce abortion in one sow by feeding and in another by intravenous injection.

The writer's work includes observations made to determine to what extent the general swine population, as observed in one of the large packing centers, was infected by *Bact. abortum*, and also includes experiments on the infection of swine by feeding bovine cultures and on the susceptibility of rabbits to infection through the alimentary and genital canals.

Organisms culturally and serologically identical with *Bact. abortum* (Bang) were isolated three times in 389 non-gravid swine uteri examined microscopically, of which number cultures were made in 259.

This organism was also isolated but once from a macerated fetus and its associated membranes in an examination of 289 gravid swine uteri of which number cultures were made in 181.

The agglutination reactions of blood serum of 435 sows slaughtered at abattoirs were positive in dilution of 1:50 in 14.7%, and in dilution of 1:100 in 19% of the specimens. 5.3% of the specimens of barrows' blood were positive in dilutions of 1:50 and 2.6% in dilutions of 1:100.

Feeding suspensions of *Bact. abortum* to a sow pregnant forty-eight days resulted in production of agglutinins, but not in abortion. Five healthy pigs and one macerated fetus were farrowed at the end of the normal gestation period. *Bact. abortum* was not isolated from the macerated fetus or from any portion of the healthy pigs. The agglutination reaction of the dam declined at, or shortly before, farrowing and was not increased by further feeding of the organism to the animal when not pregnant.

That the initial infection and subsequently ingested organisms were eliminated was indicated by the fact that *Bact. abortum* was not recovered from any of the internal organs, or the lactating and non-lactating mammary glands six months after the feeding of the last culture.

Other feeding experiments indicated a very high resistance of young swine to oral infection by the cultures used.

Experiments with rabbits showed that when fed live cultures of *Bact. abortum* these animals were readily infected in practically all cases. Young rabbits were infected almost as readily by feeding as older ones. With one exception agglutinins did not develop in these animals as a result of frequent implantation of the organism in the genital tract.

S. S.

THE PRESERVATION OF NATURAL COLORS IN GROSS SPECIMENS.

Oskar Klotz. Jrn. of Lab. and Clin. Med., Vol. VIII, No. 8, May, 1923.

A few years ago the author recommended a fluid for the preservation of natural colors of animal tissues, which has been used quite extensively with good results. Chloralhydrate is the chief ingredient of such fluid. The very high cost of chloralhydrate in Brazil led to a search for a satisfactory substitute. The present article indicates that carbon monoxide, contained in ordinary illuminating gas, can be employed in the initial preparation of the specimen in place of chloral, with excellent results. The final mounting is made in fluid containing a small percentage of chloralhydrate.

The method is as follows: After reducing the specimens to the desired size they are placed in a special jar containing a fluid consisting of:

Sodium chloride.....	8.5 parts
Sodium bicarbonate.....	5.0 parts
Formalin.....	30 to 50.0 parts
Water.....	1000.0 parts

The author finds that making the fluid isotonic with sodium chloride prevents considerable alteration of the tissue. The sodium bicarbonate is employed to overcome the acid condition which rapidly manifests itself in fresh specimens. While with but 3 to 5 per cent formalin it requires a little more time to fix specimens, a more uniform fixation is obtained throughout the tissue and no appreciable distortion occurs. The jar used is

provided with an inlet, near the base, for the intake of gas and an outlet at the top or in the tightly fitting cover. After placing the specimens in the fluid and tightening down the cover, the lower inlet is connected to the gas line. Usually the gas pressure is insufficient to force the gas up through the fluid, so that it is necessary to attach a suction pump to the outlet. The flow of gas is continued for 15 to 20 minutes, the process being repeated each day for 5 to 7 days. With specimens containing large quantities of blood the fluid frequently becomes discolored and should be renewed. The quantity of fluid should be about five times that of the specimens.

It is stated that the use of carbon monoxide for the preservation of color gives rise to a beautiful bright red hue which is quite stable and is not easily reduced by the formalin. The red blood cells do not lake and within a few days the blood is well set in the blood vessels, capillaries and tissues. Muscle hemoglobin retains a good color.

When the specimen is well fixed it should be immediately mounted in an air-tight jar, containing fluid prepared as described above, but to which has been added 2 per cent of chloralhydrate.

R. A. K.

BULBAR PARALYSIS IN CATTLE DUE TO THE ACTION OF A TOXIGENIC BACILLUS, WITH A DISCUSSION ON THE RELATIONSHIP OF THE CONDITION TO FORAGE POISONING (BOTULISM).
H. R. Seddon. Jour. Comp. Path. and Thera., xxxv, (1922), 147.

The writer isolated from the bones of an animal that had died of the disease an anaerobic toxigenic bacillus. The organism differs morphologically and culturally from *B. botulinus* (*Clostridium botulinum*). The name *B. parabotulinus* is proposed.

The disease was reproduced in horses and cattle by the subcutaneous injection of small amounts of the toxin. Definite results were not obtained by feeding the culture. Guinea pigs and sheep were susceptible to oral administration of toxin.

Seddon discusses the clinical aspects in considerable detail. Two forms are recognized: (a) the paralytic, and (b) the cripply. In the former there is difficulty in eating, salivation, protrusion of the tongue, staggering, especially of the hind legs. The temperature remains normal. The duration is from 36 hours to 2 weeks. In the "cripply" type there is general unthriftiness,

and lameness of the forelegs. The bone-chewing habit is partially constant in both forms.

It was shown that the organism occurs in the decomposing carcasses of animals. It is inferred that cattle which have formed the bone-chewing habit acquire the toxic substances from this source.

F. S. J.

THE PRODUCTION OF ANTIBODIES IN RABBITS BY A SIMPLIFIED INTRATRACHEAL METHOD. F. S. Jones. Jour. Exp. Med. xxxvii, (1923), pp. 789-798.

The author describes the technic to be used for the production of antibodies by means of intratracheal injections. The animals used were rabbits and guinea pigs. The implement for the former was a milk- or teat-tube, 9 cm. long, with an external diameter of 3 mm. For the guinea pig it was a 2½-inch, 14-gauge, hypodermic needle. In both cases the tube is bent so that the bent portion forms an angle of about 70 degrees with the straight portion. The animals are etherized sufficiently to insure complete relaxation. After opening the mouth, the tongue is drawn forward with rubber forceps. The tube, after being immersed in paraffin oil, is passed backward over the tongue and into the trachea. In the rabbit it is allowed to penetrate to a distance of 1 cm., in the guinea pig 2 to 3 mm. The entire operation takes but 2 to 3 minutes. From 7 to 10 cm. of liquid can be given a rabbit without ill effects. The results (production of agglutinins, hemolysins, and precipitins) are in all respects comparable to those following intraperitoneal inoculations.

F. B.

ETT FALL AV AKTINOMYKOS I NÄTMAGE HOS TJUR. (A Case of Actinomycosis in the Reticulum of a Bull). Hilding Magnusson. Svensk Veterinärtidskrift, Stockholm, 1922, 27, 121-123. (Reprinted from Abst. of Bakt.)

A case report with references to literature in which such cases have been described previously. Illustrated. There was no sign of actinomycosis of the jaw or tongue. The symptoms consisted of diminished appetite and occasional signs of tympanites.

H. J. S.

ASSOCIATION NEWS

MASSACHUSETTS VETERINARY MEDICAL ASSOCIATION

The May meeting of the Massachusetts Veterinary Medical Association was held at the Massachusetts Agricultural College, at Amherst, on May 16, 1923.

The train was met by autos conveying those who came to the college that way. After registering at the office of the Division of Veterinary Science and Animal Pathology, the members proceeded to the Dining Hall, where dinner was served to forty-seven.

After dinner we were taken by auto for a drive to the different grounds and buildings. The stock barns were very adequate and well arranged. Some of the best cattle of different breeds in the State were exhibited.

An address of welcome was then given by President Butterfield, who tried to impress upon our minds that he was, in a way, our servant, striving to serve us in the capacity allotted to him; and that it was our school as the citizens of Massachusetts, and that he wished us to consider it as such, and offer suggestions for the betterment of the Department, which might be of vital interest to all of us. He mentioned that we were always welcome to the school, individually or as a body, and that he would be pleased to have us arrange to meet with them at least once a year.

The next speaker was Dr. Gage, who has charge of the Division of Animal Pathology. He gave a review of the Department of Veterinary Science from 1867 until the present time. He spoke quite extensively of his work with the agglutination test, especially as it has been worked out in connection with fowl diseases. Specimens were shown as demonstrations, which certainly deserved credit. This is a subject which we, as veterinarians, will be called upon to know more about in the near future, and I think it was appreciated by all.

We were shown through the laboratories, which were very complete and well arranged. Several veterinarians present were able, while passing through the Museum, to recognize specimens of their handiwork in years gone by.

Owing to lack of time Dr. J. B. Lentz, Veterinarian of the Department, was unable to carry out his part of the program, and had to be contented by giving way, trusting to a future meeting and a longer time.

C. H. PLAYDON, *Secretary.*

THE VETERINARY ASSOCIATION OF NEW SOUTH WALES

The June meeting of the Veterinary Association of New South Wales was held at 56 Bridge Street, Sydney, at 8:00 p. m., on June 5, 1923, and the question of the control of veterinary biological products, so as to safeguard the farmer from exploitation by the sale of useless and wrongly named products and purchasing goods deleterious to the health of his stock, was fully discussed.

Professor J. D. Stewart, Chairman of the Veterinary Section of the Pan Pacific Congress, outlined the nature of the work to be carried out in Sydney, during August. The programme was to be extensive, and a number of lecture meetings were to be held jointly with the Agricultural Section. He was sure the agricultural community would benefit greatly by the discussions of renowned scientists from America, Japan and our sister States.

FRANK WHITEHOUSE, *Hon. Secretary.*

CALIFORNIA STATE VETERINARY MEDICAL ASSOCIATION

The annual meeting of the California State Veterinary Medical Association was held in San Francisco, California, June 21-23, 1923, in the Eagles' Building. There were present, according to roll call, 101 California veterinarians, and as visitors, Drs. H. Jensen, of Kansas City; Dr. Douglass, State Veterinarian of Arizona; Col. W. G. Turner, V. C., U. S. A.

The meeting was opened with a most interesting address by the President, Dr. J. L. Tyler, in which he pointed out the need of more closely following up our cases clinically, rather than to depend on some biological and pharmaceutical house to make a so-called diagnosis for us.

President Tyler called on Dr. H. Jensen, who briefly outlined his recent visit to Europe. Dr. Douglass, State Veterinarian of Arizona, honored us with a few remarks on conditions in his

state. The morning session, after considering some minor business, adjourned to meet at 1:30 p. m., when a very interesting paper was read by Dr. Robert Jay, U. S. B. A. I., "Recent Literature on Swine Diseases."

Dr. H. H. Hicks, Inspector-in-charge, B. A. I., San Francisco, gave a splendid paper on "The World's Situation Regarding Foot and Mouth Disease." Dr. F. H. McNair, Berkeley, read a most interesting paper on "The X-ray as a Diagnostic Agency." Dr. H. Sinai, Health Officer of Stockton, read a very instructive paper on "The Veterinarian and Public Health," pointing out the veterinary possibilities in that line of work, he being a veterinarian.

Dr. R. A. Ball's paper on "Hemorrhagic Septicemia" pointed out some of the newer observations in this disease. Dr. J. P. Iverson, Chief of the Division of Animal Industry, gave a detailed report on tuberculosis eradication by counties in California. Dr. M. J. O'Rourke's paper, on "Diagnostic Suggestion," called every one's attention to our possible errors through haste and lack of observation.

The banquet at the Palace Hotel was a brilliant success under the direction of Dr. G. H. Hart, toastmaster, and Dr. O. J. Kron, chairman. Through the courtesy of Col. W. G. Turner, Post Veterinarian, V. C., U. S. A., a most excellent clinic was held and a demonstration of equitation by the Division was enjoyed by all.

After luncheon, served at the Post, the meeting adjourned to the Eagles' Hall, where the literary program was continued, with papers by Dr. J. J. Frey, on "California Dairy Law Enforcement." Dr. E. H. Barger presented a paper, "Some Recent Experiments Regarding Transmission of Botulinus Toxin by Flies."

Dr. W. E. Frink cited some interesting practitioners' problems. Col. W. G. Turner, Post Veterinarian, V. C., U. S. A., gave a very interesting description of his time spent in the Orient. W. M. Thomas, of Johnson & Johnson, gave a most interesting paper on "Indications for Uses of Various Sutures."

The Friday evening meeting was called at 8 p. m., when a business session was held, together with the election of officers, which resulted as follows: President, Dr. J. M. Arburna, San Francisco; Vice-President, Dr. L. M. Hurt, Pasadena; Secretary, Dr. J. P. Bushong, Los Angeles; Treasurer, Dr. J. A. Boyd, Milpitas.

On Saturday morning, June 23rd, a small animal clinic was held at the San Francisco Dog and Cat Hospital, 1371 Fulton St., where a very interesting and instructive program was rendered, with a number of very unusual operations.

Saturday afternoon's program consisted of papers by Dr. J. F. McKenna, who had an article on "Twelve Years' History of the Association" and a paper by Dr. C. M. Carpenter on "*Bacterium Abortum* Infection in Calves." both of which were well rendered and interesting.

With a short business meeting, installation of officers and the selection of the next meeting place, which is San Luis Obispo, the meeting adjourned to meet at the University of California Farm School, Davis, California, in connection with the Short Course for Veterinarians.

J. P. BUSHONG, *Secretary*.

NORTHEASTERN PENNSYLVANIA VETERINARY MEDICAL CLUB

The Northeastern Pennsylvania Veterinary Club held a meeting, devoted to the consideration of the horse, at Conyngham Brothers' Clydesdale farm, near Wilkes Barre, Pa., June 26, 1923.

Mr. Joseph M. Vial, Horse Extension Specialist, Pennsylvania State College, gave a demonstration of the "Multiple Hitch." Dr. G. A. Dick, Professor of Animal Industry, University of Pennsylvania, spoke on "The Horse Industry in General." Dr. H. R. Church, Pennsylvania Bureau of Animal Industry, spoke on "The Horse Situation in Pennsylvania."

DELAWARE-LEHIGH VETERINARY CLUB

The Delaware-Lehigh Veterinary Club held a meeting at the Percheron farm of General Harry C. Trexler, at Allentown, Pa., on June 27, 1923.

Mr. Joseph M. Vial, Horse Extension Specialist, of Pennsylvania State College, Dr. H. R. Church, of the Pennsylvania Bureau of Animal Industry, and Dr. G. A. Dick, Professor of Animal Industry, University of Pennsylvania, were the speakers of the day.

MISSOURI VETERINARY MEDICAL ASSOCIATION

The annual meeting of the Missouri Veterinary Medical Association was held at Sedalia, June 27-28, 1923.

Mayor F. F. Hatton welcomed the Association on behalf of the city of Sedalia, and Dr. Elmer Johnston, of Excelsion Springs, responded on behalf of the Association. Dr. B. C. Davis then delivered the presidential address.

Dr. H. A. Wilson, State Veterinarian, addressed the meeting, his subject being "Dead Hog Indemnity and Compulsory Testing Laws of Our State, with Which Our Practitioners Should Be Familiar."

Dr. Horace Bradley, Deputy State Veterinarian of Missouri, presented a paper entitled "Federal Centralization of Power in Tuberculosis Eradication and Other Things Pertaining to the Tuberculin Test." In this paper Dr. Bradley directed attention to what he considered undue usurpation of power upon the part of the federal authorities, as well as unjust discrimination against veterinarians in state employ and in private practice.

Dr. R. Logan Allen gave some interesting case reports on "Some Carload Hogs" and "Parturient Paresis." Dr. A. T. Kinsley led the discussion on these reports.

After luncheon the program was resumed with the subject of "Rabies," presented by Dr. A. T. Kinsley, in the absence of Dr. A. W. James, who had been scheduled for this subject. Dr. Kinsley reported an outbreak of rabies, in which a number of mules and cows were lost. Upon investigation it was learned that on each farm where these large animals had died of rabies, there was a history of a dog having died some time previously, in all probability from rabies.

Dr. A. D. Glover gave a good, practical paper entitled "Abortion; Its Influence on Practice and How Dealt With." This was followed by a fine discussion.

Dinner was served at the Hotel Hildebrandt, with Dr. D. F. Luckey acting as toastmaster.

Mr. Robert S. Clough, County Agent, responded to "The Farmer, the Farm Bureau and the Veterinarian;" Dr. M. E. Gouge, "Cooperation of Allied Endeavors;" Prof. D. W. Chittenden, of the University of Missouri, "Essential Factors in the Profitable Production of Horses."

The film "Out of the Shadows" was shown at the Liberty Theatre, following the dinner.

The Thursday morning session was opened with a round-table discussion, conducted by Dr. A. T. Kinsley. Drs. C. N. and E. N. Hutcherson presented some interesting case reports. Dr. J. D. Ray served "Hash."

The election of officers resulted as follows: President, Dr. R. Logan Allen, of Windsor; Vice-President, Dr. J. L. Jones, of Blackburn; Secretary-Treasurer, Dr. Fred C. Cater, of Sedalia; Trustees, Dr. B. C. Davis, of Carrollton (1st Dist.); Dr. H. Jensen, of Kansas City (2nd Dist.); and Dr. J. T. Jenneman, of St. Louis (3rd Dist.)

The 1924 meeting will be held in Excelsior Springs.

FRED C. CATER, *Secretary-Treasurer.*

OKLAHOMA STATE VETERINARY MEDICAL ASSOCIATION

The annual meeting of the Oklahoma State Veterinary Medical Association was held at Medicine Park, Okla., July 9-10, 1923. The meeting was called to order at 10:00 a. m. by President F. F. Meads, with about 50 veterinarians present, many of whom were accompanied by their families.

The address of welcome, by Hon. Jno. C. Kinard, mayor of Lawton, and the warm hospitality shown by his remarks, demonstrated the appreciation of Lawton by the Association having selected Medicine Park as their meeting place. The response to the address, by Dr. E. V. Robnett, State Veterinarian of Oklahoma, fittingly expressed the appreciation of the hearty welcome extended the Association by the members and visitors present.

President Mead's address dealt forcibly with the problems which confront the veterinary profession, through the shortage of veterinary students attending our colleges. Papers offered by Major Wilfred J. Stokes, on "Mallein Testing," and Dr. J. S. Groves, on "The Packers' Stockyards Administration Act," were very interesting and instructive and were well discussed.

The round-table talk, conducted by Dr. R. C. Moore, considered problems confronting the country regarding veterinary education, the veterinarian as a dispenser of drugs and other veterinary remedies, and the use of local anesthetics in equine surgery, all of which were well discussed.

By resolution a hearty vote of thanks was extended Hon. Jno. C. Kinard, mayor of Lawton, and the management of

Medicine Park, for the many favors and privileges extended to the Association, and to Dr. Geo. Pugh for the splendid work done as chairman of the local committee on arrangements.

A round-table talk conducted by Dr. Allen, on "Tuberculosis Eradication and Accredited Herd Work and Indemnity and Appraisements," occupied a large part of a session, with due interest, and was very instructive.

The holding of this meeting at a summer resort in the Wichita Mountains was to some extent an experiment, but proved to be so satisfactory that the Association decided to change the annual meeting to the winter session, when all business will be taken care of, so as to leave the summer meeting free for a general conference of veterinarians who might be induced to participate and spend an entire week in discussing veterinary subjects a small portion of each day and devote the remainder of the time to pleasure.

Medicine Park is a beautiful summer resort and playground on Medicine Creek, in the Wichita Mountains, in Southern Oklahoma, with splendid bathing facilities in pure running water, plenty of mountain scenery, with an abundance of good fishing. A Government Preserve of 16,000 acres for wild animals is near by, well stocked with buffalo, deer, elk, wild turkeys and other game, all of which will furnish an abundance of recreation for a week or more.

The Lawton Waterworks Dam, across the river, sixty feet high between two mountains, creates a large lake, more than sixty feet deep, of pure spring water which abounds in fish. The Park is five miles from Fort Sill, one of our Government's permanent military camps.

This conference will be under the management of the Oklahoma State Veterinary Medical Association, and will be open to the veterinarians and their families from all parts of the country. As it will be made an annual affair, it is hoped many from other states, as well as Oklahoma, will take advantage of this opportunity to spend their annual vacations in this way and at the same time cultivate the acquaintance of their neighboring veterinarians.

Hotel accommodations are good and rates reasonable, with plenty of detached cottages for rent at very reasonable rates and free camping grounds in abundance. The Park Management did everything they could to make our stay pleasant.

The experimental meeting was a success and all are looking forward to a grand reunion of veterinarians next summer. Make your plans now to be there.

The present officers were continued in service until the winter meeting in Oklahoma City.

R. C. MOORE.

NORTHWESTERN PENNSYLVANIA VETERINARY MEDICAL ASSOCIATION

The regular quarterly meeting of the Northwestern Pennsylvania Veterinary Medical Association was held on July 10, 1923, at Conneaut Lake, Pa. After enjoying an excellent dinner, which was served at the hotel, the members met at the opera house.

Drs. H. R. Church and W. S. Gimper of Harrisburg, Pa., and Dr. G. A. Dick, of Philadelphia, addressed the meeting. Following these addresses each member asked a question, which was thoroughly discussed by all present. After the literary program a clinic was held at the fair grounds.

VIRGINIA VETERINARY MEDICAL ASSOCIATION

The 29th semi-annual meeting of the Association was held at Ocean View, Virginia, July 12-13, 1923. The meeting was called to order by President E. J. Will, promptly at 10 o'clock on Thursday. After the reading and approval of the minutes of the last meeting, the reports of committees were called for. The only report was from the Auditing Committee which reported the books correct and a nice balance in the treasury. The program called for *papers*. There were none presented.

This Association is perhaps fortunate in having a number of men who can present their subjects *ex tempore*. The first talk was by Dr. P. M. Graves, of Culpepper, on "Anthrax in Cattle." Dr. Graves has had a large experience with this disease and gave a very interesting account of the results of his control work during the last few years. It is regrettable that this talk could not be reproduced. The discussion was spirited and stressed the great importance of careful and rigid sanitary methods. Dr. J. G. Ferneyhough, State Veterinarian, urged the importance of proper destruction of diseased carcasses and care in differential diagnosis.

Dr. R. M. Staley, of Philadelphia, gave us a very interesting and instructive talk on "Rabies and the Various Methods of Treatment." It is greatly regretted that this talk had not been written.

Adjournment was then taken until Friday, in order that all could enjoy the bathing and spend a pleasant social evening. The Association was called to order at 10 o'clock Friday morning and the President announced the appointment of five members of the Board of Censors in accordance with the by-laws: Drs. J. A. Turlington, of Wachapreague; B. W. White, of Emporia; W. G. Chrisman, of Blackburg; P. J. Landis, of Weyer's Cove; and J. T. Wilson, of Hampton.

The first talk was by Dr. W. G. Chrisman, of Blacksburg, on "Mammitis in the Cow." Dr. Chrisman gave us the result of his experience in a number of cases and gave us a very excellent extemporaneous address. This was followed by a very full discussion.

Dr. R. E. Brookbank, of the Federal B. A. I., gave a very full account of the work of tuberculin testing and discussed the relation of the practitioner to the accredited-herd testing. This brought the meeting to a close. Except for the fact that there can be no record of the various talks that were made, the meeting was one of our most successful. Thirty-five members were present and everyone enjoyed himself to the full. The next meeting will be the thirtieth (30th) annual meeting and will be held at Murphy's Hotel, Richmond, Virginia, the second Thursday and Friday in January, 1924.

GEO. C. FAVILLE, *Secretary.*

NORTH DAKOTA VETERINARY MEDICAL ASSOCIATION

The 22nd annual convention of the North Dakota Veterinary Medical Association was held in Fargo, July 12 and 13. The place of meeting was at the Veterinary Building of the Agricultural College and there was a good attendance of veterinarians from all parts of the State. Dr. Louis Van Es, of the University of Nebraska, discussed at length the most prevalent diseases of poultry and swine. The address was delivered in an interesting style which is characteristic of the doctor's discussions and the important points in connection with the symptomatology, pathology and therapeutics of these particular disease conditions were set forth in a clear, systematic manner.

Dr. Van Es stated that the matter of hygiene was of prime importance in connection with the swine and poultry raising industries. The fact was emphasized that the present-day veterinarian must take his place as an advisor to his clients and by virtue of his knowledge of the laws of sanitation recommend measures for the elimination of those factors suitable for the development of disease conditions. He must discard the old conception of what constitutes veterinary service, which is the treatment of diseased individuals rather than protective measures guarding the health of numbers of healthy individuals. These protective measures consist of advice relative to sanitary measures and the practitioner must set a scale of charges for this advice in the same manner as he charges for any other professional service and must not feel that it is necessary to leave medicines and operated animals at each and every stop along the pathway of his professional life.

Dr. Van Es is one of the charter members of the North Dakota Veterinary Medical Association and his presence at this meeting afforded great pleasure to all of the members who welcomed him as one whose past work in North Dakota has proved of the greatest value in the building up of the profession in this state.

Dr. W. J. Butler, State Veterinarian of Montana, addressed the Association upon the subject of external animal parasites and the methods for their control. His talk was full of practical suggestions and he demonstrated the preparation of the crude-oil-emulsion dip which has proved vastly superior to the old method of dipping with crude oil. The Doctor strongly recommended the lime-sulphur and the crude-oil-emulsion dips in all types of mange conditions, with the exception, of course, that the crude-oil dip must not be used for sheep, as the wool is injured.

Dr. L. M. Roderick, of the Agricultural College, took up the problem of spoiled sweet clover hay and its effects upon animals. This is a research problem which is as yet unsolved and the purpose of the address was to bring the condition to the attention of the practitioners so that difficulty would not be experienced in the diagnosis of the condition.

Dr. W. F. Crewe, State Veterinarian of North Dakota, discussed the matter of recent legislation and recently proposed legislation pertaining to the use of anti-hog cholera serum and hog cholera virus. This matter is not so important in North Dakota at the present time, but with the advent of more extensive

hog raising it will undoubtedly prove to be just as red hot an issue as it has been in other states. The danger to the interests of all members of the veterinary profession created by the operations of the professional grafter was the motive for this discussion and it is certainly a wise policy to anticipate the danger of radical legislation and prepare for it in good time.

The business meeting which followed the regular program and which terminated the session resulted in the election of Dr. A. F. Elliott, of Milton, as President for the year 1924; Dr. J. V. Miles, of Ellendale, Vice-President; Dr. R. S. Amadon, of the Agricultural College, Secretary; and Dr. B. C. Taylor, of Hillsboro, Treasurer.

With the weather conditions the best they have been in years for the time of season and the near proximity of the Fair Grounds, where the Inter-State Fair was in progress, it is needless to state that all members in attendance at the meeting expressed themselves as greatly enjoying their visit.

R. S. AMADON, *Secretary.*

TEXAS SHORT COURSE FOR GRADUATE VETERINARIANS

The faculty of the School of Veterinary Medicine of the A. & M. College of Texas conducted a short course for graduates at College Station from July 16 to 21 inclusive. This is the first short course for graduate veterinarians that has been held in the state of Texas and it was a success. The veterinary profession was well represented at this short course. Veterinarians in attendance included Major Mitchell and Lieut. Dildine, army veterinarians from Fort Sam Houston; Dr. H. Singleton, of the Bureau of Animal Industry, from Houston; Dr. L. H. Baker, of the Western Weighing and Inspection Bureau, of Houston; and twenty-five representative practitioners from various sections of the State.

The schedule was well arranged and included lectures on the principal infective diseases, as well as lectures and demonstrations on nutritional disorders, losses from poisonous plants and splendid discourses on feeds and feeding of all farm animals. Various serological tests and proper methods for conducting autopsies were demonstrated and brief periods were devoted to the exhibits of pure-bred horses, cattle and swine. Perhaps the most popular part of the program was the clinic, which included well selected surgical and diagnostic cases.

"Diseases of Swine" was handled by Dr. A. T. Kinsley, of Kansas City, Mo., in five lectures, one each day. The subject of "Poultry Diseases" was covered by Dr. R. C. Dunn, in two lectures. Dr. S. N. Blackberg disposed of "Poisonous Plants" and "Nutritional Diseases." Dr. Hubert Schmidt lectured on "Anthrax" and "'Down in the Back' of Cattle." Canine practice was given considerable attention, the subjects of "Rabies" and "Sore Mouth" being presented by Dr. A. A. Lenert, and "Distemper," "Hookworm Disease" and "'Running Wild' of Dogs," being covered by Dr. R. P. Marsteller. Dr. E. W. Price spoke on "The Preparation of Specimens for Laboratory Diagnosis."

This course was a success because of the untiring efforts of the veterinary staff of the Texas A. & M. College, and particularly should Dr. R. P. Marsteller be commended for his special attention to every detail in conducting the course and for the comfort and pleasure of the attending veterinarians. One evening was devoted to a demonstration and discourse on "The History of the Horse," by Dr. M. Francis, who is probably the best authority on this subject in America.

Pleasures such as watermelon feasts and a barbecue were intermingled with the intensive course that had been provided.

It was unanimously agreed by those in attendance that the veterinary short course was a success and the veterinary faculty was requested to repeat such a course annually for the benefit of the profession of Texas.

A. T. K.

MINNESOTA STATE VETERINARY MEDICAL ASSOCIATION

A Short Course for Veterinarians, offered jointly by the University of Minnesota and the Minnesota State Veterinary Medical Association, at its twenty-fifth semi-annual meeting, was held at University Farm, St. Paul, July 18-19, 1923. About one hundred and fifty veterinarians attended the sessions and they forcefully expressed their interest in every class-hour conducted.

The horse received a prominent place throughout the period. Dr. H. E. Bemis, of Iowa State College, very ably discussed the diseases of the teeth and fortified his statements by reports of careful clinical studies on a number of cases admitted to the hospital. He also presented kaleidoscopic views of the horses entered in the recent saddle-horse endurance tests and told of

the various pathologic developments observed as a result of these trials. The well known horseman, Mr. Wayne Dinsmore, held the audience spellbound while telling of the "Utilization of Horse Power."

"The Horse Situation from the Breeder's Standpoint," by Mr. W. S. Corsa, of the Gregory Farm, Whitehall, Ill., was exceedingly interesting and well received. Performance is always a delight and for this the veterinarians were entertained by the Twin City Driving Club, with a matinee driving card at Hamline track, State Fair Grounds. Dr. M. R. Higbee, of Albert Lea, a practitioner and member of the club, introduced Mr. Ryan, the man who owned and sold the highest priced horse from Minnesota. Dr. E. W. Berg exhibited his five-gaited horse and also rode a fast runner which won his race.

Much interest was displayed in the paper and demonstrations on "Caponizing," by Dr. John Patterson, of Hedrick, Iowa. Dr. L. Van Es, of the University of Nebraska, presented a clear and vivid discussion of certain clinical and pathological syndromes of "Swine Diseases." He stressed the idea of a necropsy, before making a diagnosis or beginning treatment in a drove of swine.

Dr. W. L. Boyd, of the University of Minnesota, presented an interesting paper covering the results of an investigation on the changes in the reproductive organs of the cow following parturition. A paper on "The Clinical Phenomena Following Overloading of the Rumen with Green or Soft Corn," was presented by Dr. W. L. West, of Waseca, and "The Treatment of Stricture and Atresia of the Teat," by Dr. D. E. Bleecker, of West Concord.

The meeting was marked by the fact that the material presented was not all theory. Instead, the members were kept busy observing and practicing practical problems. Dr. W. E. Fretz, of the Bureau of Animal Industry, demonstrated his new needle-guard for intradermal tuberculin injection. Dr. C. P. Fitch demonstrated methods for securing blood from cattle for making biological tests for abortion disease. The tuberculin test of chickens was demonstrated by Dr. R. E. Lubbehusen. Drs. Boyd and Bemis performed several major surgical operations on cattle and horses.

A banquet was enjoyed by the members on the evening of the first day, which was presided over by Dean W. C. Coffey, of the

Department of Agriculture of the University of Minnesota. About thirty of the wives and children were entertained by the Association through the local committee.

H. C. H. KERNKAMP.

WEST VIRGINIA STATE VETERINARY ASSOCIATION

The annual meeting of the West Virginia State Veterinary Association was held at the Elks Building, Wheeling, W. Va., July 10-11, 1923, with a large attendance of members. The State Veterinary Examining Board, with its new Secretary, Dr. O. C. Bradley of Fairview, W. Va., who succeeded S. W. Langford, of Keyser, W. Va., held its session on the first day of the meeting. The second day was taken up with the reading of papers and discussions and a very interesting session developed.

MISSOURI VALLEY VETERINARY ASSOCIATION

The thirtieth annual meeting of the Missouri Valley Veterinary Association convened at the Hotel Rome, Omaha, Nebraska, July 23, 1923, with President H. B. Treman, of Rockwell City, Iowa, in the chair. President Treman's opening address covered many topics of timely interest and importance to the veterinarians in the Missouri Valley.

The literary program was opened with a paper by Dr. F. Perrin, of Lincoln, Neb., entitled "Treatment of Fractures in Small Animals." Dr. Perrin stated that, due to the advent of the automobile, dogs were more frequently injured than formerly and that very few dogs come out of an automobile accident without a fracture. He rather inclined to the use of fish glue as the most suitable material for casts, having certain advantages over plaster of paris, starch and silicate of soda. An animated discussion followed, led by Dr. J. C. Flynn, of Kansas City, Mo., who related some experiences with fractures of the jaw. Doctors J. I. Gibson, A. Trickett and R. C. Moore also took part in this discussion.

An illustrated lecture, entitled "Surgical Treatment of Infected Wounds of the Navicular Bursa of the Horse" was given by Dr. R. C. Moore, of St. Joseph, Mo. This was a splendid presentation of the subject and Dr. Moore brought out the point that the great majority of horses suffering from the condition could now be saved through operative interference, where such cases used to be regarded as hopeless.

The afternoon session was opened with an address by Dr. H. Preston Hoskins, Secretary-Editor of the A. V. M. A. Secretary Steel had assigned him the subject "What the American Veterinary Medical Association Can Do for the Practitioner." Dr. Hoskins did not confine himself strictly to this particular subject, but lead up to it by relating some recent history and outlining in a general way some of the things which it was hoped would be accomplished through the amalgamation of the offices of Secretary and Editor. Dr. Hoskins touched upon the progress being made by the Committee on Policy and indicated briefly some of the recommendations which would probably be made to the Association at Montreal, in the report of the Policy Committee. Many of these recommendations were designed with the distinct intention of improving conditions for the men in active practice. The discussion was led by ex-President A. T. Kinsley, who brought out several points which had not been covered by Dr. Hoskins.

In the absence of Dr. L. Van Es, his subject, "The Control of Swine Diseases by Use of Sanitation" was presented by Dr. H. M. Martin, of the University of Nebraska. The paper was thoroughly discussed, particularly in relation to the subject of disinfecting hog lots contaminated with ascarid ova. Dr. Martin emphasized the resistant powers of these ova and outlined what appeared to be the most rational system for preventing re-infestations.

Dr. N. S. Mayo, of Chicago, Ill., was unable to be present on account of his having been called to Camp Custer for military duty. He had forwarded his paper, however, which was read by the Secretary. It dealt with anthelmintics in swine, and was in the form of a preliminary report on the use of several new anthelmintics for the eradication of ascarids in swine.

"The Dispensing of Hog Mineral Mixtures by the Practitioner" was very ably presented by Dr. P. L. Cady, of Arlington, Nebr. Dr. Cady went thoroughly into the subject of mineral requirements for hogs and his paper was followed by a very spirited discussion, which led into the subject of deficiency diseases, vitamins, etc.

Dr. B. H. Brooks, of Riverton, Iowa, presented "Therapeutic Notes." He related his experiences with various methods of medical treatment in handling a number of diseases commonly met by the veterinarian.

Monday evening the visiting veterinarians were escorted to the Ak-Sar-Ben entertainment. Those who have witnessed

performances by the Knights of Ak-Sar-Ben in previous years do not have to be told what a splendid entertainment is provided by this unique organization. If anything, the performance this year was even better than on previous occasions.

The Tuesday morning session was opened by Dr. R. S. Walden, of Lennox, South Dakota, who presented the subject of "Sanitary Methods in the Handling of an Outbreak of Anthrax." Dr. Walden explained his so-called "piano-box" method for the fumigation of the clothes worn by those who had to attend animals on anthrax-infected premises. He favored kresol dip as the best disinfectant for his part of the country, on account of its miscibility with the hard water in those parts. He is also a firm believer in lime and advocates the burying of carcasses under lime when burning is not possible. One of the best discussions of the meeting followed Dr. Walden's paper. The points which were most prominently touched upon were the clinical diagnosis of anthrax, the selection of tissues for laboratory diagnosis, the disposition of carcasses and the disinfection of the premises.

Dr. R. S. Foulk, of Holton, Kansas, presented a paper entitled "Sanitary Methods to be Used in the Control of Contagious Abortion of Cattle." Dr. Foulk stressed the importance of preventing the contamination of the feed and water supply, as he believed that most infections took place by way of the alimentary tract. He is a firm believer in the use of bacterins and his rather positive statement on this point was the signal for a rather spirited discussion relative to the value of biological products for the control of infectious abortion. The discussion extended into the field of porcine abortion in its relation to the bovine disease.

Dr. G. H. Mydland, of Horton, Kansas, read a splendid paper entitled "Diagnostic Symptoms and Differential Treatment of Various Forms of Colic in the Horse." This paper will be published in the JOURNAL. A splendid discussion followed, centering around the significance of vomiting in the horse and its relation to rupture of the stomach.

Dr. G. P. Statter, of Sioux City, Iowa, addressed the meeting on the subject of "Milk and Meat Inspection in Missouri Valley States, with Special Reference to Small Towns." This was followed by a very good discussion. Those who took part included Dr. J. H. McLeod, of Charles City, Iowa, with a population of 7,000; Dr. G. H. Mydland, of Horton, Kansas, with a population of 4,500; and Dr. J. S. Barbee, of Kansas City, Mo., with a

population of 350,000. Dr. J. I. Gibson very heatedly deplored the desecration of the milk bottle, in calling attention to some of the uses to which milk bottles are sometimes put.

One of the most important papers on the program was presented by Dr. J. A. Kiernan, Chief of the Tuberculosis Eradication Division of the Bureau of Animal Industry. His address was entitled "The Future Place of the Accredited Veterinarian in the Accredited-Herd Plan." This very timely and important paper is being published in this issue of the JOURNAL.

Dr. Kiernan was followed by Professor H. R. Smith, of the National Live Stock Exchange, who spoke on the marketing of live stock from a tuberculosis-free county. Professor Smith brought out that a sum of approximately ten million dollars is now available for fighting bovine tuberculosis; that there are 450 men devoting their entire time to this work and that results are being obtained, as is indicated by the fact that the amount of tuberculosis in cattle has been reduced from 2.6 per cent in 1916 to 2 per cent in 1922.

The percentage of tuberculosis in hogs still runs high, the average for the United States being 14.3 per cent. The packer figures on this loss in doing business and it goes into the overhead. This is why the packer is only too glad to pay a premium of ten cents per hundred pounds on live hogs coming from a tuberculosis-free county. Professor Smith emphasized the fact that this is a cold business proposition and not philanthropy in any sense. He figured that it means approximately \$17.00 per ear and a premium of something like \$20,000 per year for a state like Iowa. Professor Smith announced that seven counties in North Carolina and four counties in Michigan had been approved the day before, July 23rd, and that two hundred additional counties throughout the country were working on the project.

Mr. E. M. Boddington, attorney for the Associated Serum Producers, was present, having just returned from a trip to Europe. He related some of his experiences in several European countries, especially in France and Italy. Those who heard Mr. Boddington listened to a real treat and will undoubtedly never forget his description of conditions and practices in the countries he had so recently visited. It is safe to say that not a single one of his hearers had very much of a desire to go to Europe right away, after Mr. Boddington had finished.

A business session concluded the day's program. Secretary Steel presented his annual report, and Dr. B. W. Conrad reported

briefly for the Defense Committee. Several proposed amendments to the constitution and by-laws were presented. These will be acted upon at the next regular meeting of the Association. The most important amendment is one which provides for holding but one meeting annually, this meeting to be held during the summer. The amendment also provides that in case the American Veterinary Medical Association meets at any point in Iowa, Nebraska, Kansas or Missouri there shall be no meeting of the Missouri Valley Veterinary Association that year, but that the Board of Trustees shall hold a meeting at the time and place of the A. V. M. A. meeting for the transaction of necessary business. It is believed that this change will remove all of the objections which have been raised to the continued existence of the Association as interfering with the various state associations in the Missouri Valley.



DR. G. P. STATTER
President of The Missouri Valley Veterinary Association

The election of officers resulted as follows: President, Dr. G. P. Statter, of Sioux City, Iowa; Vice-President, Dr. R. S. Walden, of Lennox, So. Dak.; Secretary-Treasurer, Dr. E. R. Steel, of Grundy Center, Iowa; Trustees, Dr. H. B. Treman, of Rockwell

City, Ia.; Dr. P. L. Cady, of Arlington, Nebr.; Dr. Homer A. Wilson, of Jefferson City, Mo.; Dr. R. S. Foulk, of Holton, Kans.; Dr. J. I. Gibson (member-at-large), of St. Joseph, Mo.

Wednesday was set aside for an all-day clinic in the Sales Pavilion in the Stock Yards. Dr. A. T. Kinsley demonstrated the post-mortem lesions of various diseases in pigs, these having been prepared and selected to show the following conditions: Acute cholera, chronic cholera, parasitic invasions, ulcerative and diffuse necrotic enteritis, erysipelas, intrauterine infections, salt poisoning, lye poisoning, hemorrhagic septicemia and other conditions met in the field of swine practice.

Dr. H. B. Raffensperger, of the B. A. I., Chicago, Illinois, demonstrated the lesions in the lungs of pigs caused by the larvae of the ascaris, as well as the larvae themselves in the lung tissue, with the aid of the microscope.

Other demonstrations included the passing of the stomach-tube in pigs, by Dr. P. C. Molgard, of Eldora, Iowa; the castration of the cat in the standing position, by Dr. J. C. Flynn, of Kansas City, Mo., the intradermic tuberculin test, by Dr. C. A. Jerome, of Omaha, Nebr.; with examinations of the reactors.

Dr. C. E. Ackerman, of St. Joseph, Mo., brought out some very good points in the treatment of chickens with drugs and demonstrated the administration of various forms of drugs to poultry.

The comment everywhere was that the meeting was highly successful and very encouraging, considering the difficulties that the Association has been facing. The attendance was approximately 300. Many veterinarians arrived for the clinic, who were unable to attend the other two days, on account of being busy vaccinating.

E. R. STEEL, *Sec.-Treas.*

SOUTH CAROLINA ASSOCIATION OF VETERINARIANS

The fourteenth annual meeting of the South Carolina Association of Veterinarians was held at Chester, S. C., on July 23-24, 1923, with a large number of veterinarians present. The large attendance showed the interest taken in the profession and the feeling of good fellowship existing between the members.

The address of welcome was delivered by Mr. Caldwell, president of the Tri-County Guernsey Association. Dr. W. A. Barnette, of Greenwood, responded to the welcome.

The papers presented the first day included: "Rumination in the Ox," by Dr. J. H. Yarborough, of Lowryville; "Notes from My Canine Practice," by Dr. Pascal C. McClain, of Gastonia, N. C.; "The Common Ante- and Post-Mortem Conditions of the Cow Due to Foreign Bodies," by Dr. M. R. Blackstock, of Spartanburg.

On the second day of the meeting the following papers were read: "Some Important Parasites and Their Control," by Dr. J. H. Rietz, of Columbia; "Bovine Sterility," by Dr. W. A. Barnette, of Greenwood; "Veterinary Jurisprudence," by Dr. Benj. McInnes, of Charleston; "Fright Disease in Dogs," by Dr. J. T. Dixon, of Rock Hill.

All papers were thoroughly discussed and all reported a very good time. Sumpter was selected for the next summer meeting. The winter meeting will be held in Columbia.

An automobile trip to Mr. Caldwell's dairy, following the business session, was much enjoyed.

M. R. BLACKSTOCK, *Secretary*.

KENTUCKY VETERINARY MEDICAL ASSOCIATION

The summer meeting of the Kentucky Veterinary Medical Association was called to order by the President, Dr. H. Gieskemeyer, at the Lebanon Chautauqua Grounds, July 25-26, 1923. This was indeed an ideal place to hold an out-door summer meeting. The building was an open-air affair, surrounded on all sides by immense shade trees, making it a most comfortable place. After a few remarks by the President, Hon. C. C. Boldrick was introduced. He welcomed the Association to Lebanon, as only the true Kentuckian can. In response Dr. M. H. Doller thanked him and assured him that we would partake of all the kind invitations extended us.

Mr. H. J. Childress, county agent, then addressed us on "The Relations of the County Agent and the Veterinarian." He stated that in the beginning the county agent used serum and virus in self-defense, on account of there being so few graduate veterinarians. He also stated that he thought that the county agent was more capable of using virus than the uneducated "horse doctor," but now that we had qualified veterinarians in most counties, there was no occasion for the county agent to work in this field, but that the work of county agents should be along the lines of agriculture and the selection of better sires. He stated

that when the county agent found out what his job is, the cooperation between the agent and the veterinarian would be one hundred per cent.

President H. Gieskemeyer read a very interesting paper on "Honesty of Purpose." and suggested various plans to carry on the good work at the meetings. Dr. A. J. Kay gave a very interesting case report concerning a fracture of the rim of the acetabulum in a valuable bull. Dr. T. P. Polk's paper on "Veterinary Extension Work in Kentucky," was very interesting. He stressed the importance of cooperation of county agent and veterinarian. Dr. J. H. Luallen read a very interesting paper on an outbreak of a disease in cattle that occurred in his county and this brought forth considerable discussion.

Dr. W. H. Simmons, State Veterinarian, read a paper on "Prevalence of Animal Diseases in Kentucky." He stated that the most important were contagious abortion, bovine tuberculosis, blackleg, hemorrhagic septicemia, hog cholera, sheep scab and necrobacillosis. He stated that great progress had been made in the eradication of bovine tuberculosis and hog cholera. He stated that sheep troubles were his greatest concern at present. but felt sure that this trouble would be removed in a very short time.

The first paper after luncheon was read by Dr. Elmer Lash, of Washington, D. C., representing the U. S. B. A. I. on "The New Policy Regarding the Appraisals of Tuberculin Reactors," and was discussed by Dr. Wm. F. Biles, Inspector in Charge for the B. A. I. in Kentucky.

In the absence of Dr. A. J. Steiner, of the University of Kentucky, his paper on "Animal Parasites" was read by Dr. W. W. Dimock. It was discussed as follows: Dr. L. H. Middaugh, on swine parasites; Dr. A. J. Kay, on sheep parasites; Dr. A. S. Barnes, on horse parasites; Dr. H. Gieskemeyer, on dog parasites. These papers were followed by a general discussion, following which the meeting was adjourned.

We returned to the hotel, where a banquet was served at 8 p. m., the business men of Lebanon acting as hosts. A real good time was enjoyed, the high lights being the playing of the Negro Jug Band, of Louisville; the keen wit of Mr. O. D. Thomas, toastmaster, and the piano playing of Dr. "Billy" Hickman. This was followed by an illustrated lecture by Drs. T. P. Polk and D. Smith.

For the Thursday morning session the first subject on the program was "Abortion and Sterility," by Dr. W. W. Dimock, with discussion by Drs. William Coffee and C. E. Palmer.

A business session was then held. Following the report of the Secretary, Dr. D. E. Westmoreland read a paper "Legislation, Past and Future." He gave a brief outline of the veterinary profession in Kentucky and suggested various means to further the interests of the graduate veterinarian in this state.

A committee was appointed to establish a minimum charge for the tuberculin testing of cattle and instructed to report back at the next meeting. A committee was appointed to arrange for the publication of a bulletin, to be issued yearly to the members of the Association.

At the clinics which followed, the following operations were performed: ridgling operations on the horse, by Drs. Robert Fisher and Wm. Coffee; castration of ruptured boar, by Dr. J. H. Luallen; peroneal tenotomy, by Dr. F. H. Reister; spaying operation in the bitch, and many others. The clinic was the largest held by this Association.

Hopkinsville was selected for the next meeting, to be held on Feb. 6-7, 1924. This brought another Kentucky meeting to a close with the same large attendance and good fellowship predominating.

J. A. WINKLER, *Secretary-Treasurer*.

TENNESSEE VETERINARY MEDICAL ASSOCIATION

The annual meeting of the Tennessee Veterinary Medical Association convened at the Hermitage Hotel, Nashville, Tennessee, July 26-27, 1923. President Woods, of Murfreesboro, presided. The morning session consisted of an address of welcome by Mayor Hilary Howse, to which Dr. E. I. Smith, of Nashville, responded. Following this, a short business session was held and the election of officers resulted as follows: Dr. W. B. Lincoln, of Nashville, President; Dr. A. C. Topmiller, of Murfreesboro, First Vice-President; Dr. A. E. Robertson, of Nashville, Second Vice-President; Dr. L. G. Brown, of Franklin, Secretary, and Dr. W. M. Giles, of Franklin, Treasurer.

The afternoon session consisted of discussions on hog cholera and epilepsy in dogs. Dr. J. P. O'Connor, of the Bureau of Animal Industry, opened the subject of hog cholera in which a number of members participated. Dr. M. Jacob, of Knoxville,

read a short paper on a mysterious nervous disease in dogs and spoke extemporaneously regarding his experiences. The last on the afternoon program were two reels, "The Horse in Motion" and "Roads to Wonderland," from the Bureau of Animal Industry, furnished by the local Bureau force. The former reel proved to be a most instructive one and was very favorably commented upon by the majority present. The latter reel was entertaining in that it revealed some very picturesque mountain scenery in the West.

At night supper was served in a romantic manner under the soft lights of Japanese lanterns at Cumberland Park on the bank of the Cascade Plunge. A few of the plump and not-so-plump members ventured into the water, all of which helped to entertain those who were too timid to don a bathing suit.

On Friday, in the forenoon, a very interesting clinic was provided by Dr. George R. White, of Nashville. Dr. White showed himself to be a very skillful and easy operator. Among the operations which he performed was etherizing and deodorizing a skunk. This operation was performed under glass and the audience was inclined to keep a safe distance until the glands were removed. The air was heavy with the characteristic odor, which is easily recognized. Dr. White exhibited a young skunk which showed the wounds rapidly healing in about ten days after an operation. These animals will be kept as pets and the owners claim that they are harmless and very interesting.

A number of one-pound chickens were available and Dr. White cleverly demonstrated the simple method of caponizing. This attracted considerable attention inasmuch as the capons make such remarkable growth and produce a meat which is exceedingly desirable.

Dr. O'Connor demonstrated in a very skillful manner how to hold a post-mortem on a cholera hog. The lesions were made plain to all the spectators and the demonstration was pronounced the best they had ever seen.

This closed the program and everyone went away happy. It was decided to hold the next meeting a year hence at Chattanooga, Tennessee, and it is sincerely hoped that every member will attend and bring his wife, as the presence of the ladies always lends an air of refinement to every gathering.

L. G. BROWN, *Secretary*.

NORTHWESTERN OHIO VETERINARY MEDICAL ASSOCIATION

The semi-annual meeting of the Northwestern Ohio Veterinary Medical Association was held at Russell's Point, Ohio, August 1-2, 1923, with about ninety in attendance.

The first day the morning session was devoted to business. At noon a banquet was served in the "Hotel Dining Room Beautiful." A glance at the menu will explain why any slow cases of impaction may have followed, even though no cases of acute indigestion were reported.

MENU

Cream of Tomato Soup		
Salted Wafers		Croutons
Fried Spring Chicken, a la Maryland		
Sliced Tomatoes		Queen Olives
Sweet Pickles		Celery Hearts
New Potatoes in Cream		Scalloped Corn
Iceberg Head Lettuce		
Thousand Island Dressing		
Fruit Salad		Chilled Canteloupe
Patriotic Ice Cream		Delia's Chocolate Cake
Mother's Famous Cherry Pie		
Assorted Cakes		
Coffee	Iced Tea	Milk
Salted Almonds		After Dinner Mints

In the afternoon those present indulged in a very fine literary feast, consisting of the following papers: Dr. Alvin Broerman, "The Common Diseases of Poultry and the Treatment;" Dr. F. A. Zimmer, "Relation of State Service to the Practitioner;" Dr. P. T. Engard, "Why the Necessity of a Practice Law?"; Dr. Harry T. Moss, "Some Observations in Small Animal Practice;" Dr. R. R. Shaw, "Feeds and Feeding Brood Sows;" and Dr. W. F. Wise, "A Veterinarian and His County Fair."

Dr. E. V. Hoyer substituted for Dr. E. S. Augsburg, who was unable to present his paper, "Some Diseases Affecting Swine other than Cholera." Dr. Paul Vaughn presented "Interesting Subjects."

The Association unanimously passed a resolution endorsing the plans for bovine tuberculosis eradication in Ohio, as formulated by the Federal and State Departments.

C. A. FAST, *Secretary-Treasurer*

NORTH CENTRAL OHIO VETERINARY MEDICAL ASSOCIATION

The third triennial meeting of the North Central Ohio Veterinary Medical Association was held at the hospital of Drs. Case and Planz, Akron, Ohio, July 26, 1923.

The meeting opened with a cattle clinic at the farm of Mr. W. E. Wright, on the Medina road, four miles west of Akron. Mr. Wright is said to have the finest and highest producing herd of Guernseys in Ohio.

In the afternoon a horse, dog and chicken clinic was held at the hospital. Then a trip was made to the Ohio Stock Food Farm, where a clinic was conducted by Dr. Frame. There are 3500 hogs on this farm, feed on garbage from the city of Akron. Dr. Frame explained how to keep hogs well, while being fed on garbage. Dr. Case performed a covered operation, for scrotal hernia, on a pig. Later the members went to the Anna Dean Farm, where the Telling-Belle Vernon Dairy is located. Here Dr. C. W. Eddy conducted a sterility clinic, assisted by Dr. Case. A post-mortem was held on a reactor, followed by a good discussson.

On the return to Akron the members stopped at Young's Hotel, where a fish dinner was served and a business meeting conducted. An evening clinic was held at the hospital.

The meeting as a whole was booth entertaining and instructive, and greatly enjoyed by all who attended.

The ladies were entertained by Mrs. C. H. Case.

C. C. WADSWORTH, *Secretary*.

BRITISH COLUMBIA, WASHINGTON AND OREGON VETERINARY MEDICAL ASSOCIATIONS

The veterinarians of British Columbia, Washington, Oregon and Idaho held their third annual joint meeting in Portland, Oregon, August 2-3-4, 1923. The attendance reached about eighty, many of the members being accompanied by their wives, and a few by their whole families. There was a good representation of the younger members of the profession, which is an encouraging sign. The headquarters were at the Imperial Hotel and the meetings were held in the Chamber of Commerce rooms in the Oregon Building.

The gathering was addressed by Dr. W. G. Morehouse, President of the Oregon State Veterinary Medical Association. A

welcome to the city was extended by His Honor the Mayor. Dr. E. E. Wegner responded in a way that reflected just credit, both on the speaker as well as the profession.

A number of very excellent papers made up the program. Dr. R. E. Hunt, of Roseburg, Oregon, reported on "Salmon Poisoning in Dogs." Dr. E. A. Schmoker, of the Carnation Farms, presented "Sterility in Cattle," illustrated with colored charts. Drs. R. J. Bestul, of Grants Pass, Oregon, H. D. Peterson, of Dallas, Oregon, J. R. Fuller, of Walla Walla, Wash., and J. N. Shaw, of Tillamook, Oregon, reported on a number of interesting cases.

Dr. J. C. Exline, of Olympia, Washington, described the technique of the inspection of sheep for scabies. Dr. E. A. Ehmer, of Seattle, read a paper entitled "Organotherapy." Dr. H. G. Miller, of Corvallis, Oregon, covered the subject "Mineral Metabolism." Dr. J. A. Grau, Bureau of Animal Industry, read a paper entitled "Some Swine Diseases of the Northwest." Dr. W. H. Antles also spoke on this subject.

"Canine Distemper" was presented by Dr. R. A. Button, of Tacoma. Lieutenant J. R. Ludwig, of the Veterinary Corps, located at Vancouver Barracks, Wash., addressed the meeting on "Army Veterinary Service."

Thursday evening was spent at the City Auditorium where a moving picture entertainment was given, under the auspices of the Northwestern Veterinary Association. The pictures included such numbers as "Exit Ascaris," "Out of the Shadows," "The Horse in Motion," etc. The show was open to the general public.

Friday afternoon a clinic was held. In the evening a banquet was given at the Chamber of Commerce, with sixty-eight present. Meetings of the several state associations were held Saturday morning, with a joint session in the afternoon, followed by a tour of inspection.

All veterinarians in the Northwest are looking forward to entertaining the American Veterinary Medical Association in 1925. We are all working together toward that end.

The officers for the Washington State Veterinary Medical Association were elected as follows: Dr. H. A. Trippeer, Walla Walla, President; Dr. R. J. Donohue, Outlook, Vice-President; Dr. Carl Cozier, Bellingham, Secretary-Treasurer.

CARL COZIER, *Secretary-Treasurer,*
Washington State Vet. Med. Asso.

COMMUNICATIONS

SOLUBLE TAR TO REPLACE ARSENIC IN TICK ERADICATION WORK

TO THE EDITOR:

Since the first vat for tick eradication was constructed in Hillsborough County, Florida, in 1913, I have been preparing the arsenical concentrate used in charging the vats in Hillsborough County. While my preparation has always been used by government men in charge of tick eradication work in Florida, in preference to all other such preparations, it has never been recognized by the Bureau of Animal Industry.

Commencing with January 1, 1923, and using one vat for experimental purposes, I have used soluble tar in the proportion of one per cent; that is, one gallon of soluble tar to each one hundred gallons of water. I am now charging a number of vats with this preparation and the results are highly satisfactory.

It is absolutely non-poisonous and entirely safe, in any proportion, for animals and man. The effect on the cattle in the cleaning and brightening of the coat and the elimination of the worry of flies for a considerable period after dipping are very noticeable.

I am sending you this communication as I presume there are other professional men who will be as glad to be as free from the dangers of arsenic as I am. I cannot see that it makes any difference to the tick, whether it is poisoned or choked to death.

FRED W. PORTER.

Tampa, Florida, July 25, 1923.

VETERINARY EDUCATION

TO THE EDITOR:

In a recent number of one of our veterinary journals there appeared an advertisement of the St. Joseph Veterinary College, offering a three-year course of instruction in veterinary medicine, to begin October 8, 1923.

I have before me the catalog of the above advertised course which does not give the names of any officers except the president, nor the names of any members of the faculty. As I have been and am still interested in the St. Joseph Veterinary College,

I think it is but fair to the veterinary profession and to myself to say that no such course has been authorized by the Board of Directors of said college of which I am Secretary at the present time, neither do I approve of such a course in any way.

I, like many others, have thought the present entrance requirements to veterinary colleges too high for the times and conditions of the country, but to permit veterinary colleges to go back to the days when they admitted whom they chose, and conducted a course without restrictions of any kind, and cast on to the profession at this time men whom such institutions would be likely to turn out, is surely not only a step but a long stride backward, the consequences of which should be looked upon very seriously, as it would certainly tend to greatly lower the high standard we have attained.

As one who has spent the best of his life to help reach the present goal and one who loves the profession dearly, I wish to protest against any course of veterinary instruction that does not meet the requirements of the Bureau of Animal Industry of the Department of Agriculture of the greatest country on earth.

R. C. MOORE.

St. Joseph, Mo., August 1, 1923.

ARMY VETERINARY SERVICE

VETERINARY TRAINING AT CAMP CUSTER

The following veterinary officers of the Reserve Corps, were ordered to Camp Custer, Michigan, the middle of July for fifteen days special training: Lt. Col. L. A. Merillat, Lt. Col. N. S. Mayo, Major D. M. Campbell, Capt. James Ash, Lts. Nolechek, Ogilvie and Van Zandt.

The work consisted of practical training in problems that are likely to be encountered under actual field conditions and special training along army veterinary lines. The veterinary work was in charge of Major Burt English, Camp Veterinarian, assisted by Lts. Ewen and Kintner, all of the regular army.

Under war conditions it was estimated that ninety percent of the animal casualties are due to exhaustion and emaciation. The various methods of preventing these conditions were fully presented. The problem of standings for horses under field conditions is another important problem that was studied and in this connection the standings and picket lines at Camp Custer were

carefully inspected and the good and bad features pointed out. The question of feeds and feeding of army animals, under both peace and war conditions, was also considered fully and it was shown how "sand colic," that formerly was a serious problem at Camp Custer, had been entirely prevented.

Other subjects studied were veterinary sanitation and administration, the control of transmissible diseases under war conditions and the inspection of animal food products for the army and grain and forage for the animals. In the "terrain exercises," in which all reserve officers took an active part, the veterinary officers selected the collecting stations for animal casualties and devised the best methods of caring for injured animals.



VETERINARY RESERVE OFFICERS AT CAMP CUSTER

Left to Right—Maj. English, Lt. Ewen, Lt. Kinter, Lt. Col. Merillat, Lt. Col. Mayo, Maj. Campbell, Capt. Ash, Lt. Nolechek, Lt. Ogilvie, Lt. Van Zandt.

Excellent instruction in equitation was given all veterinary officers by Lt. Ewen, who is not only an expert horseman but also an excellent polo player. The whole course of training at Camp Custer was well planned and executed. All reserve officers had only the highest praise for the course that was not only interesting but intensely practical. The regular army officers in charge of the training rendered all assistance possible and the veterinary reserve officers received splendid help from Major English and Lts. Ewen and Kintner.

N. S. M.

• THE CONESTOGA VETERINARY CLUB

The Conestoga Veterinary Club held its July meeting out-of-doors. Dr. John W. Adams, Professor of Veterinary Surgery, University of Pennsylvania, demonstrated several operations.

MISCELLANEOUS

NEW REGULATIONS ACCREDIT COUNTIES PRACTICALLY FREE OF CATTLE TUBERCULOSIS

An amendment to the Federal regulations having to do with the eradication of cattle tuberculosis, in which provision is made for classifying certain areas where the disease has been practically eliminated as modified-accredited areas, has just been signed by Acting Secretary of Agriculture Pugsley, and will take effect on and after July 23, 1923. There are now many counties in various states where this cattle plague practically has been eradicated and many others in which the clean-up work has gone very far. As a result of this action by the department these areas will be recognized and will be freed of certain inhibitions which are necessary in other territory. The provisions contained in these new regulations were unanimously adopted by the United States Live Stock Sanitary Association, at its annual meeting last winter, and by representatives of the various cattle breeders' associations.

The regulations will be carried out by the Bureau of Animal Industry in cooperation with the state live stock sanitary authorities. The states will maintain quarantines to protect the designated areas from the introduction of untested animals from other parts of the state or from other states.

Under the amended provisions a county may be designated as a modified-accredited area when a complete test of all the cattle in the area shows less than one-half of one per cent to be reactors, that is affected with tuberculosis. Those few herds in which infected animals were found will be quarantined and can not be retested within less than sixty days from the date of the original test.

Once an area is put into this modified-accredited classification no cattle can be brought in unless from an accredited herd or after having passed a satisfactory tuberculin test, except that under certain conditions cattle may be brought in for slaughter or for feeding and grazing.

When an area is designated by the cooperating state and federal authorities as a modified-accredited area it will remain so classified for three years, providing there is no indication, through animals slaughtered or in other ways, that the percentage of

tuberculosis does not exceed one-half of one per cent, at any time. If it is found that one per cent or more of the cattle in an area are found to react, then all cattle must be retested; if the infection is between one-half of one percent and one per cent, then only the infected herds must be retested, and when their percentage of reactors is reduced below one-half of one per cent the area may be classed as a modified-accredited area.

The first list of counties to be announced by the Chief of the Bureau of Animal Industry as being modified-accredited areas is as follows: Indiana—Dearborn; Michigan—Hillsdale, Charlevoix, Antrim, Emmet; North Carolina—Scotland, Rowan, Pender, New Hanover, Davis, Davidson, Cumberland, Cabarrus, Buncombe, Forsythe; Tennessee—Bradley, Marshall. Tests have shown all these counties to have less than one-half of one per cent of tuberculosis.

DO NOT BE TAKEN IN

We are advised by Dr. S. Crouch, of Klamath Falls, Oregon, that one Dr. B. C. McClintock, who claims, among other things, to be a graduate of the Chicago Veterinary College, class of 1894, is circulating himself throughout California and the Northwest at the expense of the veterinary profession in those parts. He is charged with securing money under false pretenses, according to information at hand, working upon the sympathies of members of the profession, and being somewhat of an expert in high finance, real estate deals, etc. According to our good friend Dr. John L. Tyler, of Huntington Park, California, this imposter has been fined for illegal practice and served time in jail on this account and some others. He appears to be a bad egg.

VISITORS AT THE JOURNAL OFFICE

Among those who called at the JOURNAL office recently are: Dr. J. C. McNeil, Chief Dairy and Food Inspector, of Pittsburgh, Pa.; Dr. H. W. Jakeman, Pitman-Moore Company, Boston, Mass.; Drs. E. P. Schaffter, J. W. Vance, B. C. Smith, Ashley G. Stamp, Hugo Cornehl, Earle F. Sheffield, Harry Lebeson and S. Brenton, all of Detroit.

Since 1914 it is reported the horse population of Russia has decreased by about one-half. The explanation is that approximately 16,000,000 of them have been eaten by the people.

—*Our Dumb Animals.*

NECROLOGY

JAMES GUNION RUTHERFORD

Dr. J. G. Rutherford died July 24, 1923, at Ottawa, after an illness of several months. At the urgent suggestion of his physician, Dr. Rutherford had gone to the Pacific Coast, the past winter, thinking that his condition would be benefited. For a time he seemed to show some improvement. On July 9th, while on tour with the Board of Railway Commissioners, he was taken seriously ill, at Penticton, British Columbia. He was sent to Ottawa, in a private car, and placed in a local hospital. Although the best medical care and attention was given him, he sank rapidly, his long illness having exhausted his reserve powers.

Born at Mountain Cross, Manse, Peebleshire, Scotland, on Christmas Day, 1857, he came to Canada at the age of 17. After studying at the Ontario Agricultural College, at Guelph, he entered the Ontario Veterinary College and graduated, in 1879, as the gold medalist of his class. He practiced at various times and places in Canada, the United States and Mexico. In 1884 he located at Portage la Prairie, Manitoba. He practiced here for many years, and also gave considerable of his time and attention to the breeding of horses. For several years he was President of the Horse Breeders' Association of Manitoba.

Dr. Rutherford's entry into public life really began in 1892, when he was elected to the Manitoba Legislature, to represent the constituency of Portage Plains. In 1896 he was re-elected by acclamation and a year later was elected to the Dominion Parliament to represent the constituency of Macdonald, which at that time comprised over one-sixth of the Province of Manitoba. In 1901 he represented the Dominion Department of Agriculture as Special Quarantine Officer in Great Britain.

In 1902 Dr. Rutherford was appointed Chief Veterinary Inspector for Canada. Two years later he organized the Health of Animals Branch and was made Veterinary Director-General. In 1906 he took over the office of Live Stock Commissioner, in addition to his other duties. A year later he organized the present Meat and Canned Foods Inspection Service. He created the Pathological Division and established the Biological Laboratory at Ottawa.

Dr. Rutherford made two trips to Rome, in 1908, as the Canadian delegate to the International Institute of Agriculture. The same year he represented Canada at the International Tuberculosis Congress, in Washington. In 1910 he was created a Companion of the Distinguished Order of Saint Michael and Saint George, in recognition of his distinguished services to the Dominion and the Empire.

Upon leaving the Government service in 1912, Dr. Rutherford was immediately engaged by the Canadian Pacific Railway, through Lord Shaughnessy, to take charge of the live stock interests and developments of the Northwest. The following year he was appointed superintendent of Agriculture and Animal Industry in the Department of Natural Resources, at Calgary. From 1913 to 1919 he was President of the Western Canada Live Stock Union. In November 1918 he was appointed to the Board of Railway Commissioners, assuming office in February, 1919, and continuing as a member of the Board up to the time of his death.

Dr. Rutherford joined the American Veterinary Medical Association, at the meeting in Minneapolis in 1902. The same year he was elected First Vice-President, and for four successive years he was re-elected a Vice-President. At the Philadelphia meeting, in 1908, he was elected President. He was a member of the Executive Committee, from 1902 until 1909, and during the years from 1903 until 1911 he served on many important committees. He was Chairman of the International Commission on the Control of Bovine Tuberculosis, from 1909 until 1915.

It was mainly through the efforts of Dr. Rutherford that the University Commission caused the Ontario Government to take over the Ontario Veterinary College and place this institution under the auspices of the Provincial Department of Agriculture and the University of Toronto, at the same time raising the entrance requirements and materially enlarging the curriculum.

While he was Veterinary Director-General, Dr. Rutherford realized the necessity of having a reasonable number of French-speaking inspectors for the work of the Health of Animals Branch, due to the fact that there were between two and three million French-speaking people in Canada. At that time the Faculty of Comparative Medicine of Laval University enjoyed the unique distinction of being the only veterinary college in America where instruction was given in French. With the thought of assisting this institution to turn out highly qualified

veterinarians, Dr. Rutherford brought it about that two of the professors at the college were sent to France, to take special courses, one at Alfort, under Professor Barrier, and the other at Lyons, under Professor Arloing.

In recognition of his services to the advancement of veterinary science the University of Toronto, at a Special Convocation held on June 3rd, 1920, conferred on Dr. Rutherford the honorary degree of Doctor of Veterinary Science, he being the first to receive this distinction from the University of Toronto, which is sufficient evidence of the high character of the honor.

Dr. Rutherford was truly a great statesman, broad-gauged, courageous and possessed of wonderful judgment. It is not generally known that he was the author of the Grain Act, regarded as one of the best pieces of legislation ever enacted by the Canadian Parliament. The creation of the Railway Board was largely due to his efforts, when a member of Parliament. He was Chairman of the Reindeer Commission, appointed three years ago to study the possibilities of the reindeer industry. He was Honorary Associate of the Royal College of Veterinary Surgeons and Membre Correspondant of the Société Centrale de Médecine Vétérinaire de France.

The fact that he was at all times a charming and scholarly speaker caused him to be in constant demand at gatherings of all kinds, and it is said that there were very few organizations of any importance that had not enjoyed the privilege of listening to Dr. Rutherford's delightful drolleries and genial philosophy. He possessed a keen sense of humor and his ability to charm an audience with his Scotch stories was unsurpassed, if ever equalled. He was a born raconteur. Even his more serious thoughts were often expressed in a more or less whimsical way, and as such never failed to impress his hearers, who fully appreciated the fact that the fluent speaker was an equally deep thinker. His was a master mind.

In Dr. Rutherford's going his country has lost a citizen whose purity of patriotism was one of his outstanding attributes, and the veterinary profession has lost one of its most distinguished members.

Dr. Rutherford is survived by his widow, three daughters, one brother and one sister.

ADRIAN J. MITCHELL, SR.

Dr. A. J. Mitchell, Sr., died at his home in Erie, Pennsylvania, on the morning of July 5, 1923. Death was due to heart failure. The end came very suddenly and peacefully.

Born in Livingston County, N. Y., May 28, 1853, Dr. Mitchell attended the rural schools and the Springfield (N. Y.) Academy. He matriculated in the American Veterinary College, New York City, in 1874, and spent one year in this institution. In 1877 he resumed his veterinary studies in the New York College of Veterinary Surgeons.

In 1882 Dr. Mitchell accepted a position as veterinarian for Asa Burnham's racing horses, and acted in this capacity throughout the circuit. While still in this connection and located at Coney Island, he studied under that eminent veterinarian, Dr. J. A. Going, of New York City, a member of the Royal College of Veterinary Surgeons, who conferred on Dr. Mitchell a certificate of recommendation. The same year he entered the Ontario Veterinary College, but on account of severe and repeated attacks of sciatic rheumatism he was not graduated until December 31, 1885.

Dr. Mitchell located in Erie in 1888, and was in active practice there continuously up to the time of his death. He married Miss Clare Dross, of Gowanda, N. Y., in 1880. He is survived by his widow, one daughter and one son, Dr. Adrian J. Mitchell, Jr., who was associated with his father since his graduation in 1909.

Dr. Mitchell jointed the American Veterinary Medical Association in 1911.

W. H. RICHARDS

Dr. W. H. Richards died at Emporia, Kansas, March 5, 1922, after an illness of about three weeks. Death was due to heart trouble with complications. He had been a member of the American Veterinary Medical Association since 1890.

Dr. Richards was born in Newark, Ohio, September 29, 1862. He was a graduate of Granville (Ohio) High School, Denison University, and the Ontario Veterinary College, class of 1887. He immediately located at Emporia, Kansas, and practiced there for thirty-five years, his field extending into Nebraska, Missouri and Oklahoma. Before the late war he imported Percheron and Belgian horses, and had built up quite a nice business in this line.

GEORGE F. WESTCOTT

Dr. George F. Westcott, died at his home, in Portland, Maine, July 27, 1923, after a long illness. He was fifty-four years of age. About a year ago he underwent an operation, in Boston, but received little relief. He continued to fail, although he managed to attend to his practice up until within a week of his death.

After his graduation from the American Veterinary College, in 1897, Dr. Westcott returned to his native city, Portland, to establish a practice there. He conducted a large veterinary hospital, and for the past eleven years had one of his sons, Henry B., associated with him.

Dr. Westcott joined the American Veterinary Medical Association in 1904. He was an ex-President of the Maine Veterinary Medical Association, a member of the Portland Farmers' Club, and an agent of the Maine Humane Society. He is survived by his widow, three sons, a sister and three brothers.

EDWARD ROY FAREWELL

Dr. E. R. Farewell, of London, Ontario, died suddenly in mid-ocean, of heart trouble, on July 20, 1923. He was in charge of a shipment of Canadian Store cattle, on the *S. S. Canadian Mariner*, en route from Montreal to Cardiff, England. He was apparently in good health when he embarked, and died suddenly, without exhibiting any symptoms of illness.

Dr. Farewell was born at Drayton, Ontario, June 20, 1879. He attended high school and later the Ontario Veterinary College, from which institution he graduated in 1902. He practiced his profession at Drayton, Ontario, until 1909, when he entered the service of the Health of Animals Branch. He was joined in marriage to Miss Mae Stephenson, of Elora, Ontario, in 1906. She survives him, with two young children.

Dr. Farewell was a prominent and highly respected citizen, and a highly valued officer of the Health of Animals Branch. He was a Mason, a member of the Ontario Veterinary Association, and of the American Veterinary Medical Association, which he joined in 1919. His brother, Dr. Frank Farewell, is president of the Ladies College, at Whitby, Ontario.

BIRTHS

Dr. and Mrs. W. C. Verploeg, of Pella, Iowa, a daughter, Phyllis Jean, June 24, 1923.

Dr. and Mrs. J. C. Luckeroth, of Seneca, Kansas, a son, Joseph Frank, June 16, 1923.

Dr. and Mrs. H. A. Hoffman, of Yellow Springs, Ohio, a son, Rogers Taylor, June 10, 1923.

Dr. and Mrs. Paul F. Scott, of Newmarket, Ind., a daughter, Margaret Louise, July 14, 1923.

Lt. and Mrs. Charles M. Cowherd, of Fort Sam Houston, Texas, twin boys, Robert Mitchell and Richard Mansur, July 28, 1923.

MARRIAGES

Dr. James S. Glover to Miss Mildred Capsey, June 6, 1923, at Toronto, Ont.

Dr. Lionel McI. Heath to Miss Nellie Stansbury, June 16, 1923, at Toronto, Ont.

Dr. Vernon A. Holby (U. P. '16) to Miss M. Ethelyn Lickley, June 30, 1923, at Cold Springs, N. Y.

PERSONAL

Dr. Harold S. Brundage (Chi. '15) is now at Georgetown, S. C.

Dr. C. C. Page, of Fostoria, Ohio, is a candidate for mayor of his city.

Dr. John A. Jaeger (McK. '16) has left Elk River to locate in Willow River, Minn.

Dr. John P. McCoy (Ont. '01) of Minden City, Michigan, is Clerk of Minden Township.

Dr. E. A. Brockmeier has located at Mapleton, Minn. He was formerly at Sanborn, Minn.

Dr. R. F. Bourne (K. C. V. C. '06) is reported as having recovered from his recent serious illness.

Dr. L. F. Vaughn, (K. C. V. C. '16) has removed from Santa Barbara to Glendale, Calif., Box 444.

Dr. Wilson Huff (Ont. '85) acts in the capacity of Meat and Milk Inspector for the City of Rome, N. Y.

Dr. H. A. Hoffman (K. S. A. C. '17) is Bacteriologist on the staff of Antioch College, Yellow Springs, Ohio.

Dr. C. D. Lash (K. C. V. C. '10) is now at Rosendale, Missouri. He was formerly located in St. Joseph.

Dr. Rex D. Bushong (K. S. A. C. '21) has been appointed Sanitary Officer of the City of Manhattan, Kan.

Dr. R. H. Tesdell (Chi. '17) has returned to Huxley, Iowa. He has been at Dayton, Iowa, for some time.

Dr. F. D. Egan (Ont. '23) is associated in practice with Dr. Chas. H. Greenfield (Chi. '12), of Detroit.

Dr. J. J. Frey (K. S. A. C. '14) is Superintendent of Dairy Service, California Department of Agriculture.

Dr. Charles A. Pyle (K. S. A. C. '07) is teaching vocational agriculture in the high school at Columbus, Kansas.

Dr. Kenneth G. McKay (Wash. '21) is Secretary of the Stevens County (Wash.) Livestock and Fair Association.

Dr. Lynn R. Cantwell (K. C. V. C. '16) of Alliance, Nebr., has been appointed State Veterinarian of Nebraska.

Dr. John T. Wilson (K. S. A. C. '10) has left Seiling, Okla., to take up a new location, at Pawnee, in the same state.

Dr. Meier Brodner (Corn. '20) has been transferred from Omaha, Nebr., to Brooklyn, N. Y. Address: 18 Amboy St.

Dr. C. E. Ranney (K. C. V. C. '18) is Chief Veterinarian for the Kaw Valley Serum Company, Kansas City, Kan.

Dr. J. F. Jansen (Corn. '15) has left Stamford, N. Y., and is now located at Oneonta, N. Y. His address is 68 Spruce St.

Dr. George Kernohan (K. S. A. C. '12) is taking post-graduate work in bacteriology at the Pennsylvania State College.

Dr. John Hoberg (Cin. '06) has accepted a position in the Dairy and Food Division of the Board of Health, Detroit, Michigan.

Dr. O. J. Phelps (Cin. '15), of Lexington, Ky., writes that he gets "a great deal of pleasure and also information from the JOURNAL."

Dr. Benj. H. Yenner (K. C. V. C. '05) has been transferred from Detroit, to Sioux City, Iowa. His address is 616 Virginia Avenue.

Dr. Howard H. Custis (U. P. '07) has given up his practice at Lajara, Colo. His present address is 221 South 41st St., Philadelphia, Pa.

Dr. C. S. Parks (Ind. '21), formerly of Cambridge, Vt., has accepted a new position and is now located at Albemarle, N. C., Box 643.

Dr. J. W. Brown (K. S. A. C. '12) has secured a patent for a combination dog collar and muzzle. The latter may be detached, if desired.

Dr. W. E. Muldoon (Corn. '13) has resigned his position as Professor of Veterinary Medicine, at the Kansas State Agricultural College.

Dr. Ray N. Parker (K. S. A. C. '17) formerly of Douglass, Kansas, is engaged in the live stock business at Clearwater, the same state.

Dr. Harry T. Moss (Cin. '05) has opened a new hospital at 640 South Main Street, Dayton, Ohio, devoted entirely to small animal practice.

Dr. H. N. Thompson (K. C. V. C. '95) is General Supervisor for the Western Weighing and Inspection Bureau, at the Kansas City Stock Yards.

Dr. L. A. White (Iowa '14), formerly of Gaza, Iowa, is now located in South St. Paul, Minn. He gives his address as Hillcrest Apartments, C-4.

Dr. F. H. Thompson (Chi. '02) has been transferred from Des Moines, Iowa, to Eugene, Oregon. His present address is 1626 Hilyard Street.

Dr. H. M. Martin (U. P. '16) recently received the degree of Master of Science from the University of Nebraska. He majored in parasitology.

Dr. E. F. Kubin (K. S. A. C. '09), of McPherson, Kansas, has been appointed a member of the Kansas State Board of Veterinary Medical Examiners.

Dr. Frank J. Baker (Corn. '05), Meat and Milk Inspector of Gouverneur, N. Y., has been appointed County Veterinarian for St. Lawrence County, N. Y.

Dr. L. H. LaFond (Mich. A. C. '23) has selected Flint, Michigan, as a location. He will specialize in small animal practice, at 2612 South Saginaw Street.

Dr. Henry C. Campbell (U. P. '02), of Philadelphia, recently suffered from a fractured ankle, received in an accident while visiting his brother at Penn's Cave, Pa.

Dr. W. G. Chrisman (Ont. '02) has resigned the position of Professor of Veterinary Science, at the Virginia Polytechnic Institute, Blacksburg, Va., effective September first.

Dr. H. T. Grossman has severed his connection with the Bureau of Animal Industry, to accept the position of Superintendent of the Newton Packing Company, Detroit, Mich.

Dr. Robert O. Biltz (U. P. '22), who has been practicing at Georgetown, Del., is engaged in state live stock sanitary control work for the Delaware Department of Agriculture.

Dr. Frederick G. Steinbach (U. P. '12) has returned from California and is again in practice at Wildwood, N. J. He gives his address as 100 W. Columbine Road, Wildwood Crest, N. J.

Dr. E. A. Schmoker (K. S. A. C. '17) has offered a prize of twenty-five dollars to the student doing the best work in Clinics, in the Veterinary Division, Kansas State Agriculture College.

Dr. John B. Taylor (U. P. '17), bacteriologist and pathologist at the South Dakota Agricultural College, visited his home in Philadelphia, during July, while in the East on his vacation.

Dr. Y. Takehara, of Takukimina, Ogasaguin, Shizuokaken, Japan, in renewing his subscription to the JOURNAL, writes that he has just returned home after an absence of more than six months, spent in traveling in England, France and Germany.

Dr. H. K. Wright (Mich. '15) is spending the summer in the New England States, and will return to South America in the fall. Dr. Wright has been looking after the interests of H. K. Mulford & Company in South American territory, for a number of years.

Drs. A. E. Kulp and Donald A. Eastman have dissolved their partnership at Cedar Rapids, Iowa. Dr. Eastman remains at Cedar Rapids and Dr. Kulp has located at Eldridge, Iowa, where he bought out the practice of Dr. F. H. Hasenmiller (Chi. '03).

Dr. Paul Vaughan (O. S. U. '12) has been placed in charge of the B. A. I. forces working in Ohio in cooperation with the Ohio State Department of Agriculture. Dr. Vaughan was brought to Ohio from North Carolina, when he was in charge of the tuberculosis-eradication work.

Dr. H. M. Gohn (Ont. '93), of St. Johns, Mich., was with the Knights Templar who were enroute to the recent conclave in Flint, Mich., when their special train was wrecked, near Durand. Dr. Gohn appeared to have escaped serious injury, and it was not until several weeks later that it developed that he had suffered a fracture of the coccyx.

Dr. O. V. Gunning (O. S. U. '17), writing from The Hawthorns, Tutbury, Burton-on-Trent, England, says: "I would like to take this opportunity to congratulate you on the excellence of the A. V. M. A. JOURNAL. I look forward each month to my copy arriving, not only for its sterling worth, as a practitioner's periodical, but it helps to form a link with my many friends in the profession on your side of the water."

Dr. S. Nakanishi, of Fusan, Japan, recently wrote us as follows: "I am a veterinarian, comparatively an old reader of the JOURNAL OF THE A. V. M. A., and lovely read the JOURNAL from about ten years ago continuously to now, and serving in the Chosen-Sohtokufu Institute for Veterinary Medical Research, Fusan, Chosen, Japan, for several years. I beg to offer congratulations for great development of the JOURNAL and remarkable progress of A. V. M. A."

Dr. O. E. Herl (O. S. U. '16), of the Serum-Virus Control Division of the B. A. I., located at Kansas City, has been spending the summer with his family, in Ohio. Dr. Herl was taken down with typhoid fever July 7, 1922, and confined in the hospital for eleven weeks. He returned to work only to be taken down, January 6, 1923, with "typhoid spine," a rare condition, which confined him to his bed for another eight weeks. He is now able to get about on crutches and hopes to be able to return to his work soon.

COMING VETERINARY MEETINGS

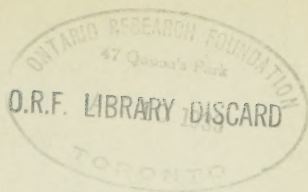
Mahoning Valley Veterinary Club, Brookville, Pa., Sept. 13, 1923. Dr. C. M. Christy, Secretary, Brookville, Pa.

Southeastern Michigan Veterinary Medical Association. Detroit, Mich., Oct. 3, 1923. Dr. H. Preston Hoskins, Secretary, 735 Book Bldg., Detroit, Mich.

Southeastern States Veterinary Medical Association. Greensboro, N. C. November 12-13, 1923. Dr. J. I. Handley, Secretary, Box 1533, Atlanta, Ga.

UNUSUAL

"A cat having a fur coat was seen in Piccadilly today," reports a contemporary. If the cat had been without one it might perhaps have been worth writing about—*Punch*.



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